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Research Paper

Cognitive Functions and Medication Compliance in relation to Quality of Life in Persons with Schizophrenia

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ABSTRACT

Background: Findings of different studies on the relationship between cognitive functions, medical compliance and quality of life in persons with schizophrenia are still contradictory and unclear. ***Aim:*** The present study aimed to examine the impact and relationship of cognitive functions and medical compliance on the quality of life in persons with Schizophrenia. ***Research Design:*** Single group cross-sectional design was used. Incidental purposive sampling method was employed to select the sample. ***Methods and Materials:*** 20 persons with schizophrenia were selected from the outpatient department of Psychiatry, Government Medical College & Hospital, Chandigarh as per the inclusion and exclusion criteria. Participants were administered various neuropsychological tests to assess the cognitive functions, Medication Adherence scale to assess the Medication Compliance and Quality of life scale for assessing Quality of life. ***Statistical analysis:*** Mean, Frequency, Pearson 'r' and Linear Regression were used to analyze the data. ***Results:*** Significant deficits were found in cognitive functions in all the participants. Around 75% of the participants were compliant to medication. Significant correlations were found among different domains of Cognitive Functions, Medication Compliance and Quality of Life It was also found that all the 20 participants had poor quality of life. Medication compliance, DVT, LMT (IR-DR) and visual working memory were found to be significant predictors of QoL. ***Conclusions:*** A clear link between cognitive functions, medication compliance and QoL is found in the present study.

Keywords: *Schizophrenia, Cognitive Functions, Medication Compliance, Quality of life*

Cognitive deficits and medication compliance are accepted as the important predictors responsible for better quality of life in persons with Schizophrenia. Past scientific evidences have come out that cognitive functioning of persons with schizophrenia is characterized by deficits. The cognitive deficits might have a progression over time and depend on the length

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of disease(Bilder, Lipschutz-Broch, Reiter, Stephen, Mayerhoff, & Lieberman, 1991).Current data shows that the severity of cognitive deficits is related to age of onset (Early and Late onset). While the subsequent length of disease do not cause add further deterioration to the deficits already present at early stages. (Ajji & Mulsant, 2008) (Mesholam-Gately, Giuliano, Goff, Faraone, & Seidman,2009)

There is a link between the functional disability of the persons with schizophrenia and their cognitive impairment. (Green, 1996) And there is also evidence that there is heterogeneous distribution of cognitive deterioration in people with Schizophrenia(Kremen, Seidman, Faraone, Toomey&Tsuang,2004). According to recent research it was found that there is significant cognitive impairment in schizophrenia, affecting up to 75 percent of the patients. A wide range of cognitive functions are affected, predominantly memory, attention, motor skills, executive function and intelligence. The cognitive impairment often precedes the illness onset.

There is increasing evidence that cognitive impairment often precedes the illness. One major issue arising from this that whether or not the cognitive impairment observed in patients with schizophrenia declines over time(O'Carroll, 2000). This issue is still inconclusive. Further longitudinal studies are required in order to settle this issue.

Poor compliance to medical treatment in schizophrenia patients is common (Goodman, Knoll, Isakov & Silver, 2005). Non-compliance may rise to 50% among patients undergoing neuroleptic treatment(Kampman, Lehtinen, Lassila, Leinonen, Poutane&Koivisto2000) and is strongly associated with poor health outcomes(Goodman, Knoll, Isako & Silver, 2005). Despite the critical importance of medication, non-compliance to prescribed treatments has been recognized as a worldwide phenomenon and may be the most challenging aspect of treating patients with schizophrenia.

Reductions in quality of life in patient with schizophrenia are strongly associated with cognitive impairment and medication non-compliance. Cognitive deficits are accepted as the core feature in schizophrenia spectrum disorders. Studies on the relationship between cognitive performance and QOL have shown contradictory results. They found that QOL is inversely related to crystallized verbal ability, attention, working memory, and problem solving, some other researcher found no significant correlation between QOL and neuropsychological measures of attention, memory, or executive functioning in patients with schizophrenia (Lysaker, Vohs,Hillis, Kukla, Popolo, Salvatore & Dimaggio, 2013). Cognitive impairment is a key component of reduced quality of life in schizophrenia; it is not the entire story as the severity of positive and negative symptoms is also a significant contributor.

Previous studies do suggest that there is a relationship and contribution of cognitive deficits and medical compliance on quality of life in persons with schizophrenia yet at the same time

clear relationship has not been established. This calls for an attempt to look into this aspect and hence the present study has been planned.

METHODOLOGY

Single group cross sectional design was used as this is exploratory nature of research. A total number of 20 consecutive participants were selected from the outpatient and inpatient department of Psychiatry, Government Medical College & Hospital Sector-32 Chandigarh as per inclusion and exclusion criteria specified below.

Inclusion criteria

1. Male and Female Patient with diagnosis of schizophrenia (F20 as per ICD 10DCR).
2. Age between 18 to 55 years.
3. Minimum duration of illness was 2years.
4. Patients who are stabilized on treatment.
5. Educated Up to standard 10 or above.
6. Those who gave consent for participation.

Exclusion criteria

1. Any other Psychiatric illness including substance abuse disorders.
2. History of head injury, trauma, any other organic, chronic and severe medical condition.
3. Long term use of any other drugs other than that prescribed for schizophrenia.
4. History of receiving long term cognitive rehabilitation/ Retraining / Enhancement therapy

Scales and Tests

Following scales and tests were used along with sociodemographic and clinical data sheet.

- ***Positive and Negative Scale (PANSS)***-PANNS is a 30-item rating instrument published in 1987 which evaluate the presence /absence and severity of positive, negative and general psychopathology of schizophrenia. All 30 items are rated on a 7 –point scale (1=absent; 7=Extreme).It requires 45-50 minutes for administration.
- ***Medication Adherence Rating Scale (MARS)*** - This is a new inventory, that incorporates features of both Drug Attitude Inventory (DAI) and Medication Adherence Questionnaire (MAQ) but which have greater validity and clinical utility. It is a valid and reliable measure of adherence to psychoactive medications. It consists 10 items in which patients describe their behavior or attitude towards their medication during the past week.
- ***WHO Quality of Life Scale Bref-26 (WHOQOL-BREF-26)*** - This Quality of Life Scale is developed by WHO group. It consists of 26 items, used in research and can be administered on individuals of 18 years and above population. It is a self-administered scale.WHOQOL-BREF is a sound, cross-culturally valid assessment of QOL, as reflected by its four domains: physical, psychological, social and environment.
- ***Cognitive Functions:*** Cognitive functions were assessedthrough following selected domains of NIMHANS Neuropsychology Battery developed by Rao et al.2004 .

A. Mental Speed

Digit Symbol Substitution Test: It is a test of visuomotor coordination, motor persistence, sustained attention and response speed. Rapid information processing is required in order to substitute the symbols accurately and quickly. The test consists of a sheet in which numbers 1-9 are randomly arranged in 4 rows of 25 squares each. The subject substitutes each number with symbol using a number-symbol key given on the top of the page. The first ten squares are for practice. This test was not administered on illiterate subjects.

B. Attention

(i) Digit Vigilance Test: It consists of number 1 to 9 randomly ordered and placed in rows on page. There are 30 digits per row and 50 rows on the sheet. The same level of mental effort or attention deployment is required over a period of time. The subject has to focus on the target digits i.e. 6 and 9 amongst other distracter digits.

(ii) Trail Making Test: It measures the focused attention. Both parts of the Trail Making Test consist of 25 circles distributed over a sheet of paper. In Part A, the circles are numbered 1-25, and the patient should draw lines to connect the numbers in ascending order. In part B, the circles include both numbers (1-13) and letters (A-L); As in Part A, the patient draws lines to connect the circles in an ascending pattern, with the added task of alternating between the numbers and letters (i.e. 1 –A-2-B-3-C,etc.).

C. Executive Functions

(i) Animal Names Test: It measures category fluency; the subject generates words, which belong to particular semantic category. The animal names test requires the subject to generate names of animals for one minute.

(ii) N Back Test (Working Memory): The 1 Back and 2 Back versions of the N Back test were used. The 1 back version requires verbal storage and rehearsal, while 2 back version requires, in addition to the above, manipulation of information.

(iii)Wisconsin Card Sorting Test: Set shifting ability is tested using Wisconsin Card Sorting Test (Milner, 1963). This test examines concept formation, abstract reasoning and ability to shift cognitive strategies in responses to changing environments. The test consists of 128 cards.

(iv) Stroop Test: It measures response inhibition the ease with which perceptual set can be shifted both to conjoin changing demands and by suppressing a habitual response in favor of an unusual one. The stimulus sheet is placed in front of the subject. The subject is asked to read the stimuli column-wise as fast as possible. The time taken to read all the 11 columns is noted down. Next, the subject is asked to name the color in which the word is printed. The time also the subject proceeds column wise.

D. Learning And Memory

(i)The Rey's Auditory Verbal Learning Test (AVLT) (Schmidt, 1996) adapted for different cultures by WHO was adapted to suit conditions in India. It consists of words designating familiar objects like vehicles, tools, animals and body parts. There

are two lists A and B, with different words in each list. Words in list A are presented at the rate of one word per second during 5 successive trials.

(ii) Logical Memory Test: Logical Memory is assessed by the immediate and delayed recall of a meaningful passage. The test consists of a short story with 21 facts. The story is read out to the subject slowly and clearly, once. An immediate recall is taken. After a delay of 30 minutes a delayed recall is taken. The delayed recall is taken without prior warning. The verbatim of the subject is noted down.

Statistical Analysis

Results were analyzed by using Descriptive Statistics like mean and frequency, Pearson correlation and linear regression with the help of SPSS 20.00.

RESULTS

Table 1 Socio Demographic details of Participants in frequency and percentage

Variables	Categories	F (%)
Gender	Male	10 (50)
	Female	10 (50)
Education	School Educated	7 (35)
	College Educated	13 (65)
Marital Status	Single	15 (75)
	Married	4 (20)
	Widow	1 (5)
Religion	Hindu	17 (85)
	Sikh	2 (10)
	Muslim	1 (5)
Family Type	Nuclear	19 (95)
	Joint	1 (5)
Locality	Urban	15 (75)
	Rural	5 (25)
Occupation	Government Job	2 (10)
	Private Job	3 (15)
	Business	1 (5)
	Homemaker	1 (5)
	Retired	1 (5)
	Unemployed	11 (55)
	Student	1 (5)

Note: F=Frequency in percentage.

As shown in table 1 the sample comprises both males and females equal in numbers (50%). Most of the participants were college educated (65%) and were single (75%). Majority of the participants belonged to Hindu religion (85%) and lived in nuclear family (95%). Most of the participants of the study were urban but were unemployed. (55%)

Table 2 Frequency (%) of participants having significant deficits in cognitive function, medication compliance and QoL

Cognitive functions	**Test**	**F (%)**
Mental Speed	Digit symbol substitution test	5 (25)
Attention	Digit Vigilance test (Sustained)	11 (55)
	Trail Making test (Focused)	2 (10)
Executive Functions	Animal names test	8 (40)
	Working memory Verbal memory Visual memory	 5 (25) 8 (40)
	WCST	12 (60)
	Stroop test	7 (35)
Learning and Memory	AVLT	7 (35)
	LMT	8 (40)
Medication Compliance	Low compliance	5 (25)
	Medium compliance	3 (15)
	High compliance	12 (60)
QoL	Total QoL	20 (Less than 75)

Note: QoL=Quality of life; F=Frequency; WCST=Wisconsin Card Sorting Test; AVLT=Auditory verbal learning test; LMT=Logical memory test; Less than 75=poor quality of life.

As shown in table 2 significant deficits were found in the cognitive functions in the participants. Most of the participants were compliant to medication (75%). Poor quality of life was found in all participants (less than 75%)

Table 3 Significant correlation between cognitive functions, QoL and MARS

Cognitive functions	**QoL**						**MARS**	
	Social		Environmental		Total QoL		R	Sig.(2 Tailed)
	R	Sig.(2 Tailed)	R	Sig.(2 Tailed)	R	Sig.(2 Tailed)		
Attention DVT	-	-	-.587**	.007	-	-	-	-
Executive Functions Stroop test	-.468*	.037	-	-	-	-	-.625**	.003
Learning and Memory AVLT Trial 5							-.458*	.042

Cognitive functions	**QoL**						**MARS**	
IR	-	-	-	-	-	-	.599**	.005
LMT IR							.505*	.023
MARS	-	-	-	-	.455*	.044	-	-

*** Correlation is significant at the 0.01 level (2-tailed).*

**Correlation is significant at the 0.05 level (2-tailed).*

Note: QoL=Quality of life; DVT=Digit vigilance test; AVLT=Auditory verbal learning test; IR=Immediate Recall; LMT=Logical memory test; MARS=Medication adherence rating scale.

As shown in table 3 significant correlation between attention and environmental QoL. Significant correlation between executive functions (Stroop test), social QoL and Medication compliance. Medical compliance was significant correlated with learning and memory (AVLT and LMT) and QoL.

Table 4 Significant predictors of QoL.

Predictors	**Beta**	**Sig.**
MARS	.455	.044
Visual N back 2 hits	-.493	.018
LMT IR	-.427	.039
DVT	.476	.003
LMT DR	.681	.027

Note: QoL=Quality of life; MARS=Medication adherence rating scale; LMT IR=Logical memory test immediate recall; DVT=Digit vigilance test; LMT DR=Logical memory test delayed recall.

As shown in table 4 MARS, Visual N back 2 hits, LMT IR-DR and DVT are the significant predictors for better quality of life.

DISCUSSION &CONCLUSION

Both cognitive functions and medical compliance are accepted as the important predictors responsible for better quality of life. From previous studies results it was found that their relationship was still contradictory and unclear.

The present study was conducted with the aim to examine the impact of cognitive functions and medication compliance on quality of life (QoL) in persons with Schizophrenia. To achieve the aim of study, three objectives were framed. First Objective of the study was to assess the cognitive functions, medication compliance and quality of life. It was found that there are significant deficits in cognitive functions in all participants. Out of 20 participants, 5 (25 %) were found to have significant deficit in mental speed, which indicates reduced information processing, Visuo-motor coordination, motor persistence, sustained attention and

response speed. Previous studies have also revealed similar findings and suggested that reduced processing speed can impair the ability to keep in step with the task-oriented jobs that are frequently held by patients with schizophrenia. Deficits in information processing of complex medication regimen can also lead to problems while adhering to medication instruction.

Previous studies showed that impairments in vigilance can result in difficulty following social conversations and an inability to follow important instructions; simple activities such as reading or watching television become labored or impossible. Vigilance deficits in patients with schizophrenia are related to various aspects of outcome, including social deficits, community functioning, and skill acquisition (Green, 1996) (Green, Kern, Braff & Mintz, 2000). Similarly in our study in the domain of attention, significant deficits were found in 11 (55 %) patients in sustained attention and 2 (10 %) patient in focused attention which indicates incapacity to attend to a task in hand for a required period of time and incapacity to perform a task in the presence of distracting stimuli.

In the domain of executive functions, significant deficits were found in animal names test 8 (40%), working memory verbal-5 (25%), visual-8 (40%), WCST 12 (60%). Impairment in animal names test indicates incapacity to generate alternates in a regulated manner. It is an aspect of mental flexibility. Thus in our study impairment in executive function was seen in about half of the patients. This finding also shows similarly with other past studies. One study found that information that is stored is not always retrieved as a result of inability to properly access semantic network (Joyce, Collinson, & Crichton, 1996). Impairment was found in AVLT 7 (35%) and LMT 8 (40%) indicates incapacity by which a person is able to gain experienced retain it. These deficits tend to be more severe than other cognitive ability domains. Previous studies found that verbal memory performance predicts success in various forms of verbal therapy and is associated with social adaptive and occupational success (Green, Kern, Braff & Mintz, 2000).

In the present study, with the objective of assessing medical compliance , it was found that out of 20 participants 12 (60%) were found to have high likelihood of compliance, 3 (15%) participants were found to have mediocre likelihood of compliance and 5 (25%) were found to have low likelihood of compliance. As discussed earlier medication compliance is closely associated with cognitive functions. Another researcher has found that poor insight and lack of illness awareness, belief that medications are no longer needed, and lack of treatment efficacy were key factors that contributed to adherence problems (Velligan, Weiden & Sajatovic, 2009).

It was found that all participants overall quality of life is less than 75 % which indicates poor quality of life.

Second objective of the study was to assess the correlation of cognitive functions, medication compliance and QoL. It was found that significant positive correlation existed between

attention domain of cognitive functions and environmental domain of QoL. This suggested that better performance in attention domain leads to better result in the environmental domain of QoL. Significant negative correlation was found between executive functions (response inhibition), social quality of life and medication compliance which is suggestive that if the person's score is increased on this domain, then the social QoL decreases. It means poor performance in this domain indicates poor social domain of QoL. One study results confirmed cognitive deficits in executive function appeared to have direct impact on the patients perceived QoL especially in social domain (Alptekin, Akvardar, Akdede, Dumlu, Işık & Pirinçci, 2005). This domain is also significantly negatively correlated with medical compliance which indicates that if the person's score is low on this domain then social QoL increases which means better performance on this domain indicates better medication compliance. One study findings indicated that a patient's compliance toward medication is associated with neurocognitive function especially verbal learning memory, executive functioning and sustained attention (El-Missiry, Elbatrawy, El Missiry, Moneim, Ali, & Essawy, 2015).

In the domain of learning and memory, significant positive correlation was found between learning and memory and medication compliance. It means that better learning process indicates better medication compliance. Higher score on learning domain of cognitive functions indicates higher medication compliance. In the domain of memory, significant correlation was found; better score on this domain is associated with better QoL. Several studies clearly indicated that marked and severe cognitive impairment were there in patients with schizophrenia who have been taken off their medication (Blanchard & Neal 1994) (McCreadie, Latha, Thara, Padmavathi, & Ayankaran, 1997) (Saykin, 1994). A significant correlation was found between medication compliance and total QoL in our study. This means good medication compliance is associated with better QoL. One study indicates that non-compliance to medication increases the risk of relapse, re-hospitalization and self-harm, increases inpatient costs and lowers QoL(Haddad, Brain & Scott, 2014).

Third objective of the present study is to find out the independent contribution of cognitive functions and medication compliance on quality of life in persons with schizophrenia. In the present study it was found that medication compliance, attention, executive function, learning and memory were significant predictors of overall quality of life. This indicates that better performance on this domain leads to better physical, psychological, social and environmental domains of QoL (Hayhurst, Drake, Massie, Dunn, Barnes, Jones & Lewis,2014). One study results confirm that cognitive deficits in executive function and working memory appear to have a direct impact on the patient's perceived quality of life especially in social domain which can either be a cause or a consequence of social isolation of patient's with schizophrenia (Alptekin et al, 2005).A clear link between cognitive functions, medication compliance and QoL is found in the present study. Most of the previous studies findings support the present study. There is a need to improve cognitive deficits by cognitive retraining and medication compliance issues by psychosocial interventions like psycho

education, behavioral interventions, motivational interviewing and cognitive approaches to improve the overall QoL.

REFERENCE

Alptekin, K., Akvardar, Y., Akdede, B., Dumlu, K., Işık, D., &Pirinçci, F. et al. (2005). Is quality of life associated with cognitive impairment in schizophrenia?. Progress InNeuro-Psychopharmacology And Biological Psychiatry, 29(2), 239-244. doi: 10.1016/j.pnpbp.2004.11.006

Bilder, R., Lipschutz-Broch, L., Reiter, G., Stephen, G., Mayerhoff, D., & Lieberman, J. (1991). 11. Neuropsychological deficits in the early course of first episode schizophrenia. Schizophrenia Research, 5(3), 198-199. doi: 10.1016/0920-9964(91)90071-x

Blanchard, J., & Neal, J. (1994). The neuropsychological signature of schizophrenia: generalized or differential deficit?. American Journal Of Psychiatry, 151(1), 40-48. doi: 10.1176/ajp.151.1.40

El-Missiry, A., Elbatrawy, A., El Missiry, M., Moneim, D., Ali, R., &Essawy, H. (2015).Comparing cognitive functions in medication adherent and non-adherent patients with schizophrenia. Journal of Psychiatric Research, 70, 106-112. doi: 10.1016/j.jpsychires.2015.09.006

Goodman, C., Knoll, G., Isakov, V., & Silver, H. (2005). Negative attitude towards medication is associated with working memory impairment in schizophrenia patients. International Clinical Psychopharmacology, 20(2), 93-96. doi: 10.1097/00004850-200503000-00005

Goodman, C., Knoll, G., Isakov, V., & Silver, H. (2005). Negative attitude towards medication is associated with working memory impairment in schizophrenia patients. International Clinical Psychopharmacology, 20(2), 93-96. doi: 10.1097/00004850-200503000-00005

Green, M. (1996). What are the functional consequences of neurocognitive deficits in schizophrenia?. American Journal Of Psychiatry, 153(3), 321-330. doi: 10.1176/ajp.153.3.321

Green, M., Kern, R., Braff, D., &Mintz, J. (2000). Neurocognitive Deficits and Functional Outcome in Schizophrenia: Are We Measuring the "Right Stuff"?. Schizophrenia Bulletin, 26(1), 119-136. doi: 10.1093/oxfordjournals.schbul.a033430

Haddad, P., Brain, C., & Scott, J. (2014). Nonadherence with antipsychotic medication in schizophrenia: challenges and management strategies. Patient Related Outcome Measures, 43.doi: 10.2147/prom.s42735

Hayhurst, K., Drake, R., Massie, J., Dunn, G., Barnes, T., Jones, P., & Lewis, S. (2014). Improved quality of life over one year is associated with improved adherence in patients with schizophrenia. European Psychiatry, 29(3), 191-196. doi: 10.1016/j.eurpsy.2013.03.002

Joyce, E., Collinson, S., & Crichton, P. (1996). Verbal fluency in schizophrenia: relationship with executive function, semantic memory and clinical alogia. Psychological Medicine, 26(01), 39.doi: 10.1017/s0033291700033705

Kampman, O., Lehtinen, K., Lassila, V., Leinonen, E., Poutanen, O., &Koivisto, A. (2000). Attitudes towards neuroleptic treatment: Reliability and validity of the Attitudes towards Neuroleptic Treatment (ANT) questionnaire. Schizophrenia Research, 45(3), 223-234. doi: 10.1016/s0920-9964(99)00204-2

Kremen, W., Seidman, L., Faraone, S., Toomey, R., &Tsuang, M. (2004). Heterogeneity of schizophrenia: a study of individual neuropsychological profiles. Schizophrenia Research, 71(2-3), 307-321. doi: 10.1016/j.schres.2004.02.022

Lysaker, P., Vohs, J., Hillis, J., Kukla, M., Popolo, R., Salvatore, G., &Dimaggio, G. (2013). Poor insight into schizophrenia: contributing factors, consequences and emerging treatment approaches. Expert Review OfNeurotherapeutics, 13(7), 785-793. doi: 10.1586/14737175.2013.811150

McCreadie, R., Latha, S., Thara, R., Padmavathi, R., &Ayankaran, J. (1997).Poor memory, negative symptoms and abnormal movements in never-treated Indian patients with schizophrenia. British Journal Of Psychiatry, 171(04), 360-363. doi: 10.1192/bjp.171.4.360

Mesholam-Gately, R., Giuliano, A., Goff, K., Faraone, S., &Seidman, L. (2009).Neurocognition in first-episode schizophrenia: A meta-analytic review. Neuropsychology, 23(3), 315-336. doi: 10.1037/a0014708

O'Carroll, R. (2000). Cognitive impairment in schizophrenia. Advances In Psychiatric Treatment, 6(3), 161-168. doi: 10.1192/apt.6.3.161

Rajji, T., & Mulsant, B. (2008). Nature and course of cognitive function in late-life schizophrenia: A systematic review. Schizophrenia Research, 102(1-3), 122-140. doi: 10.1016/j.schres.2008.03.015

Saykin, A. (1994). Neuropsychological Deficits in Neuroleptic Naive Patients With First-Episode Schizophrenia. Archives Of General Psychiatry, 51(2), 124. doi: 10.1001/archpsyc.1994.03950020048005

Velligan, D., Weiden, P., & Sajatovic, M. (2009).The Expert Consensus Guideline Series. The Journal Of Clinical Psychiatry, 70(suppl 4), 01-48. doi: 10.4088/jcp.7090su1cj

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Conflict of Interest

The authors colorfully declare this paper to bear not conflict of interests

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