Neurobehavioral Management of Behavioral Anomalies in Frontal Lobe Syndrome

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ABSTRACT
Neurobehavioral approach uses behavioral paradigm towards comprehensive rehabilitation by identifying the neurological or neuropsychological constraints that can interfere with learning and behavior of an individual. The present case study highlights the role of functional skills approach in neurobehavioral management towards cognitive rehabilitation to manage behavioral deficits in a 55-year-old man with nicotine dependence having frontal lobe lesions owing to gliosis of fronto-temporal brain regions. Based on detailed neuropsychological and behavioral assessment, a behavioral package was made involving techniques like behavioral counseling, chaining, shaping and operant methods and was carried out with the patient daily (with the help of primary caregiver) over a period of 2 months. Results showed improvement in his self-care and decrease in behavioral problems, on 12-month follow-up.

Key words: Functional skills approach, neurobehavioral management, rehabilitation

INTRODUCTION
Since the traditional rehabilitation approaches do not focus enough on the patient’s social behavior or their ability to recognize and adapt to changing situations, many patients with brain injury who make good progress according to clinical criteria still do not become integrated into the community, irrespective of the nature and level of their disability. Neurobehavioral approach, a recent rehabilitation paradigm, attempts comprehensive rehabilitation by identifying the neuropsychological constraints that can interfere with learning and behavior; and employs behavioral paradigm to control and eliminate inappropriate or unacceptable social behavior.[1] The present case study provides insights into the process of carrying out neurobehavioral management.

CASE REPORT
A 55-year-old married man, a graduate, reported with acute-onset continuous illness characterized by increased irritability, decreased self-care, repetitive speech; after an episode of generalized tonic clonic seizures, 3 years back. Gradually, over the last three years, there was an increase in, behavioral changes like disorganized behavior, aggression, fearfulness of dark, verbal perseveration, clinging behavior (especially towards wife), decreased self-care, along with impairment in occupational functioning, were observed. His self-care had decreased to the extent that he would not take bath/brush his teeth for weeks together, would soil his clothes, not allow his family members to wash his clothes. There was marked increase in his verbal perseveration and clinging behavior. His cigarette consumption also increased markedly. His MRI without contrast revealed “bilateral frontal and temporal irregular lesions with gliotic changes in bilateral frontal regions.”

Neuropsychological testing
On mini mental state examination, the patient obtained a score of 22. On National Institute of Mental Health and Neurosciences (NIMHANS),
neuropsychological battery deficits were found in his abstraction, executive functions, sequencing and psychomotor functions. On Barthel’s index of activities of daily living, he obtained a score of 12; and he was found to be completely dependent for grooming, toilet use, bathing, and partially dependent on the caregiver with respect to dressing and feeding. On behavioral analysis, he was found to be high on irritability and agitation.

Psychological case formulation
It was revealed that a vicious cycle of problem behaviours itself was acting as the maintaining factor for patient’s behavioural problems. All his behavioral anomalies (irritability, anger outbursts, not maintaining self care etc.) almost always led to increased irritability in, and negative remarks from, family members. These reactions of family members acted as environmental reinforcers of getting attention, which he was not able to get otherwise owing to everybody else’s occupational demands. His most effective and commonly used learning strategy was through operant methods. His personal and environmental strengths were his premorbid levels of self-care and the financial and emotional support of the family.

Reinforcer sampling
Done through reinforcing event menu[2] revealed that both social and tangible reinforcers would benefit the patient. Social appreciation was the social reinforcement. His immediate backup tangible reinforcer was a fixed number of cigarettes (as along with developing the adaptive self-help behavioral repertoires, it was alongside aimed to decrease his smoking). The intervention program was so planned that it targeted the specific areas of improvement in his activities of daily living and decrease in frequency of behavioral problems.

Intervention process
In the initial phase, behavioral counseling with the patient and his wife — separately and in combined sessions — was done, along with psychoeducation, since it was hypothesized that the patient would benefit from operant methods. Thus, several antecedent management strategies (strategies that alter the patient’s environment either by modifying it or adding antecedents that decrease the probability that the behavior will occur)[3] were employed. After the preparation phase, the actual shaping process was started using forward chaining. For each targeted step in the chain of behaviors for a particular behavior, he was given a token which he could later exchange for backup reinforcers. An extinction burst was observed during the middle phase of therapy, which resolved with persistently following behavioral techniques. The overt monitoring was gradually faded; however, his behavior was closely monitored and recorded throughout.

To address the goal of increasing compliance to family members’ requests, again contingency management was used. Rule training and rule of boundaries were introduced to bring a schedule in his routine and further increase compliance.[4]

A physical exercise schedule (involving yoga, playing different games, walking, jogging) was developed and was met with enthusiasm on the patient’s part. As reported in various studies, these physical exercises helped in decreasing the maladaptive behaviors of patient.[5,6] Once the patient started engaging in appropriate behaviors, his clinging behavior was also targeted through differential reinforcement.

The patient showed remarkable improvement and by the end of therapy, started taking appropriate self-care. His cigarette consumption decreased to premorbid levels, along with increased social interaction and decreased clinging behavior.

RESULTS AND DISCUSSION
By the end of therapy, the patient had shown approximately 85% to 90% improvement in the targeted self-help areas. His score on Barthel’s index of activities of daily living was found to be 18 as against the pre-treatment score of 12. He started bathing, brushing, flushing toilet regularly. He would engage in social interactions and showed a marked decline in clinging behavior and smoking. On behavioral analysis, there were no significant behavioral problems. Apart from the targeted behaviors, it was reported by his wife that after discharge he had started engaging in more leisure time activities also. Gains were maintained at the 3-month, 6-month and 12-month follow-ups. Thus, the case study illustrates that functional skills method of cognitive retraining is more suited to neurobehavioral approach of rehabilitation because it has more generality generalisability than the restorative approach.[7] As highlighted in the present case study, this approach focuses on retraining of activities, behaviors and skills that are required for day-to-day functioning through task analysis. The case study demonstrates that by focusing on the 3 key factors — needs, limitations and feasibility of patients — rehabilitationists can help in reducing the patients’ functional disability, as well as reducing the distress of caregivers, with an additional gain of enhancing quality of life of both the patient and the caregivers.[8]
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