Original Research Article

The Effectiveness of Constraint Induced Aphasic Therapy Approach to Improve Naming and Word Fluency in Non-Fluent Aphasic

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ABSTRACT

Introduction: Aphasia is an acquired communication disorder caused by brain damage that impairs a person's ability to understand, produce and use language (La Pointe, 2005). Furthermore, it is a multimodal disorder which includes additional neurological impairments such as apraxia of speech or dysarthria (Chapey, 1994). Wernicke's aphasia, Broca's aphasia, Conduction aphasia, Anomic aphasia, Global aphasia, Transcortical aphasias and subcortical aphasias are the types of aphasia. Constraint Induced Aphasia Therapy is an impairment based therapy technique. It is almost the opposite of compensatory strategies in which the person with aphasia is encouraged to use intact abilities to communicate. A person with aphasia may be constrained in using intact gesture in order to direct the individual to use impaired spoken language.
Objectives: The present research had the objective to investigate the efficiency of CIAT in naming and word fluency deficits in individuals with Non fluent Aphasia.
Method: A total of 50 non-fluent aphasic participants were taken for the research study. The naming and fluency scores were computed and recorded at this stage (0 week or pre therapy). CIAT was applied to all of the participants and the naming and fluency scores were recorded at the second stage (4th week). The patients were continued with the same therapy technique and again the final scores for naming and fluency was recorded at 8th week.
Results: A significant difference was found in the naming score at pre-therapy, 4 weeks of therapy and 8th week of therapy, as well as the fluency score at pre-therapy, 4 weeks of therapy and 8th week of therapy after using CIAT as the language therapy technique for the non-fluent aphasic participants.

Conclusion: It can be concluded that CIAT is a very effective technique to be used for non-fluent aphasic patients.

Key words: Aphasia, CIAT, naming, fluency

INTRODUCTION

Aphasia is a communication disorder that results from damage to the parts of the brain that contain language. It is regarded as one of the major causes of language disorders, particularly in adults. Individuals who experience damage to the right side of the brain may have additional difficulties beyond speech and language issues. It causes difficulties in speaking, listening, reading, and writing, but does not affect intelligence. Individuals with aphasia may also have other problems, such as dysarthria, apraxia, or swallowing problems (ASHA, 2016). Aphasia can be so severe as to make communication with the patient almost impossible, or it can be very mild. It may affect mainly a single aspect of language use, such as the ability to retrieve the names of objects, or the ability to put words together into sentences, or the ability to read (NAA, 2016).

Aphasia is an acquired communication disorder caused by brain damage that impairs a person's ability to understand, produce and use language (La Pointe, 2005). Furthermore, it is a multimodal disorder which includes additional neurological impairments such as apraxia of speech or dysarthria (Chapey, 1994). The presentation of aphasic symptoms is seen secondary to brain damage such as stroke (most frequently),

traumatic brain injury, and degenerative diseases (Murray&Chapey, 2001). A patient with aphasia may present impairment in any area of the production, comprehension and several other aspects of language. Aphasia can be classified into several types based on its symptom complex, but its major components of deficits revolve around oral production, reading, writing and auditory comprehension (Kertesz, 1977).

McNeil (1982) has identified over thirty different classification systems for *aphasia* have been identified. The most widely used is the classification scheme of Goodglass and Kaplan (1972) (Sarno, 2002; McNeil & Copland, 2011). Goodglass and Kaplan (1972) outlined the following major classification for assessing adults with aphasia such as Broca's aphasia, Wernicke's aphasia, Anomic aphasia, Global aphasia, Conduction aphasia, Transcortical sensory aphasia, Pure word deafness, Mixed nonfluent aphasia. Kertesz (1979) acknowledged eight types of aphasia namely Global, Broca's, Isolation, Transcortical Motor, Wernicke's, Transcortical Sensory, Conduction and Anomic aphasia. As per the classification given by Richard and Eric, there are seven types of aphasia. They are Wernicke's aphasia, Broca's aphasia, Conduction aphasia, Anomic aphasia, Global aphasia, Transcortical aphasias and subcortical aphasias.

There are two general categories of therapies namely communication-based and impairment-based. Communication oriented treatments, in part, assist the person in conveying messages and feelings with alternative means of communicating. This orientation is also said to involve compensatory strategies. In addition, an individual is encouraged to use any remaining language ability that succeeds in conveying messages. Therefore, communication-based activities continue to be partly "language-based" and are likely to incorporate impairment-based objectives simultaneously. PACE therapy (Promoting Aphasics' Communicative Effectiveness) is

an example of communication-based therapy. Impairment-based therapies are aimed at improving language functions and consist of procedures in which the clinician directly stimulates specific listening, speaking, reading and writing skills. CIAT (constraint induced aphasia therapy) and MIT (melodic intonation therapy) are examples of impairment-based therapy techniques. CIAT is modeled after a physical therapy for paralysis in which a patient is "forced," for example, to use an impaired side of the body, because the good side has been restricted or constrained. In applying this principle to communication functions, a person with aphasia may be constrained in using intact gesture in order to direct the individual to use impaired spoken language. A second, and perhaps more well-known, component of this treatment is that it is more intensive than typical therapy schedules and it lasts for a relatively short duration. For example, the therapy may be administered for three hours daily for two weeks. Constraint-induced therapy is almost the opposite of compensatory strategies in which the person with aphasia is encouraged to use intact abilities to communicate.

METHOD

The participants of the study comprised of 50 chronic non-fluent aphasia that includes Broca's aphasia, anomic aphasia, transcortical motor aphasia and global aphasia. The participants received CIAT in 8 consecutive weeks. The naming and fluency scores were obtained using Western Aphasia Battery at pre-therapy, 4th week and 8th week of receiving CIAT. The scores were then compared using statistical analysis.

RESULT AND DISCUSSION

Poststroke aphasia is a main cause of disability, possibly leading to compromised communication, reduced public activity, misery, and a lower likelihood of restarting work (Wade, 1986; Black, 1990; Kauhanen, 2000; Black 2005). The percentage of

patients presenting aphasia symptoms after suffering a stroke ranges between 21% and 38% according to a number of studies (Berthier, 2005).

The present study was undertaken to test the efficacy of an aphasia therapy technique   CIAT on the non-fluent aphasic patients. In speech therapy constraint means avoiding the use of compensatory strategies such as gesturing and drawing, writing etc. Forced means communication by talking and massed practice means 2-4 hours in a day.

The raw data was subjected to statistical analysis. Descriptive statistics of age was chosen for the study (mean and standard deviation). All the participants mean age is given in Table 1. Mean and standard deviation of naming and fluency scores was calculated at each phase (0, 4th and 8th week) of the course of intervention. The results are shown in Table 2, Table 3, Table 4, Table 5, Table 6 and Table 7 respectively.

Furthermore, Friedman's Two Way Analysis of Variance by Ranks was administered on the naming scores. The result depicted at α = 0.05 level of significance (95% confidence level) and the p value is less than 0.05 (p = 0.001) for naming. So, conclusion may be drawn that there is significant difference between the scores at pre-therapy and post-therapy for naming.

Table 1: Mean age and SD of participants

Participants	Mean age	SD
	46.82	14.973

Table 2: Mean and SD of naming scores at 0 week

Naming (0 week)	Mean	SD
	9.60	15.393

Table 3: Mean and SD of fluency scores at 0 week

Fluency (0 week)	Mean	SD
	1.04	1.653

Table 4: Mean and SD of naming scores at 4th week

Naming (4th week)	Mean	SD
	43.80	16.554

Table 5: Mean and SD of fluency scores at 4th week

fluency (4th week)	Mean	SD
	4.34	1.869

Table 6: Mean and SD of naming scores at 8th week

Naming (8th week)	Mean	SD
	69.40	17.042

Table 7: Mean and SD of fluency scores at 8th week

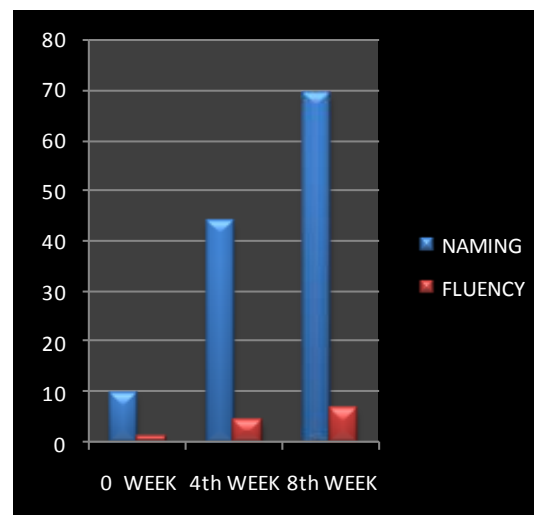| fluency (8th week)	Mean	SD
	6.70	12.023

FIGURE 1: comparision of naming and fluency scores across the three baselines

Friedman's Two Way Analysis of Variance by Ranks was administered on the fluency scores. The result depicted at α = 0.05 level of significance (95% confidence level) and the p value is less than 0.05 (p = 0.001) for fluency. So, conclusion may be drawn that there is significant difference between the scores at pre-therapy and post-therapy for fluency.

The combined results are represented in figure 1 in form of a graph. It can be seen clearly that there is significant difference between the pre-therapy and post-therapy scores for both naming and fluency stating the effectiveness of the therapy technique used, i.e., CIAT.

CONCLUSION

Aphasia is prevalent in people following stroke, which can leave a significant impact in life of patient with stroke. One of the new methods of treatment for patients with aphasia is CIAT. It is an intensive form of language therapy used to treat aphasia. It derives from constraint induced movement therapy. In language therapy constraint means avoiding the use of

compensatory strategies such as gesturing and drawing, writing etc. forced means communication by talking and massed practice means 2-4 hours in a day.

CIAT was administered on the participants and the resulting scores of the participants for naming and fluency were tabulated. Statistical analysis was done. Descriptive statistical analysis was done which included mean and standard deviation of the scores obtained from the two categories (naming and fluency) at the three baselines (0 week, 4th week & 8th week) and comparison was done. Friedman's Two Way Analysis of Variance by Ranks was carried out to obtain the results of comparison based on the performance of the participants for naming and fluency at the three baselines. There was significant difference between the scores pre therapy and post therapy for both the categories. It was evident from the study that indeed CIAT is an effective technique to be used for non-fluent aphasic patients.

REFERENCES

- American Speech-Language-Hearing Association.(1993). *Definitions of communication disorders and variations*. Available from www.asha.org/policy.
- Berthier, M. L. (2005).Poststroke aphasia: epidemiology, pathophysiology and treatment. *Drugs and Aging, 22*, 163–182.
- Chapey, R. (1994).Introduction to language intervention strategies in adult aphasia. In R. Chapey (Ed.), Language Intervention Strategies in Adult Aphasia (pp. 3-26). Baltimore, MD: Williams & Wilkins.
- Goodglass, H. & Kaplan, E. (1972).The Assessment of Aphasia and Related Disorders. Philadelphia, PA: Lea &Febiger.
- Kauhanen, M. L., Korpelainen J. T., Hiltunen P., Maatta R., Mononen H., &Brusin E. (2000). Aphasia, depression, and non-verbal cognitive impairment in ischaemic stroke.*Cerebrovascular Diseases, 10*, 455–461.
- Kertesz, A., & Phipps, J. B. (1977).Numerical taxonomy of aphasia. *Brain and Language, 4*(1), 1-10.
- LaPointe, L. (2005). Aphasia and Related Neurogenic Language Disorders. Boston, MA: Thieme.
- Murray, L. L. &Chapey, R. (2001). Assessment of language disorders in adults. In R. Chapey (Ed.), Language Intervention Strategies in Adult Aphasia and Related.
- McNeil, M. R. & Copland, D.A. (2011).Aphasia theory, models, and classification.In L.L. LaPointe (Ed.), Aphasia and Related Neurogenic Language Disorders (pp. 27-47). New York: Theme Medical.
- Sarno, M. T. (2002). Aphasia.In V.S. Ramachandran (Ed.), Encyclopedia of the Human Brain. Volume 1 (pp. 181-192). Academic Press: San Diego.
- Wade, D. T., Hewer, R. L., David, R. M., & Enderby, P. M. (1986). Aphasia after stroke: natural history and associated deficits. *Journal of Neurology Neurosurgery & Psychiatry, 49,* 11–16.

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