

A Case Study: Behavioral Analysis and Understanding Speech Language Problem (SLP) of Aphasia in Vidarbha, Maharashtra (India)

Chavhan P. H¹, Sangode V. K²

Department of Zoology, R.T.M. Nagpur University, MJF Educational campus, Nagpur (MH), India

Abstract: Language is defined as an accepted structural symbolic system for interpersonal communication composed of sounds arranged in ordered sequence to form words, with rules for combining these words into sequences or strings that expresses thoughts, intentions, experiences, and feelings. The human communicated with speech and symbolic languages. In Vidarbha region commonly four vernacular languages were spoken by the various community people viz, Marathi, Hindi, Waradi and Chhattisgarhi. The Speech Language Problem (SLP) disorders including Aphasia and Dysarthria such as Flaccid dysarthria, Ataxic dysarthria, Spastic dysarthria, Hyperkinetic dysarthria, Hypokinetic dysarthria, Apraxia include Oral apraxia and Verbal apraxia, Dementia, Voice disorders are common neurological disorder were commonly found. Our result showed that among observed population on gender bias male shows 4% SLP whereas female shows 3% thus 7% population shows SLP as major disorder. Therefore we present here a simplified and easy approach towards the understanding and examination of SLP to solve myth and confusion among local peoples of Vidarbha region.

Keywords: Speech language problem, Behavior, Aphasia.

1. Introduction

Speech is the mechanical function of one's ability to communicate in oral language. The human capacity for acquiring speech and language must derive at least in part from the genome. Humans must be explored, especially for understanding how human brains uniquely recombine a finite set of sounds to generate infinite meaning (Hauser *et al.*, 2002). Vocal learning is another important component of language. Vocal learners are animals with a talent for modifying innate vocalizations to imitate or create new sounds. Given the complexity of language and the variety of speech and language disorders (which affect up to 1 in 20 children) (White. S. A *et al.*, 2006) no single tissue or animal model is likely adequate for discovery of the neural bases. Developmental disorder of speech and language occur 7% of children (Tomblin *et al.*, 1997) in the absence of causal factors such as mental retardation, deafness, neurological deficits or social deprivation. Speech language problem (SLP) is the genetic speech and language disorder provide the opportunity to instigate the behavioral, physiological and morphological basis of language and development.

There are five types of dysarthria, differentiated by which area of the nervous system is affected. The disorder is developmental, manifesting itself early in childhood in the first attempts at speech and persisting throughout adulthood. Speech appears effortful and words ending after are unclear. Word order also frequently is compromised. Most of the affected and unaffected family member are employed in the service sector (e.g. food store, restaurants, house cleaning, store keeping, driver, public transport, laborious, worker and farmer). Of the affected members, the majority left the education system at age 16 years, typically ceasing speech therapy and proper handling from that time. Despite their difficulties in communication, however, they remain sociable, amicable and persevering in their efforts to be understood (Watkins, K. S *et al.*, 2002).

The identified for affected or unaffected person is based on the assessment of SLP and speech behavior function. The disorder is transmitted as an autosomal – dominant monogenic trait (Hurst *et al.*, 1990). A genetic linkage study mapped disorder in the KE family to a locus designated *SPCH1*, a 5.6 centimorgan interval in 7q31 (Fisher *et al.*, 1998). More recently, a point mutation has been identifies in the affected family member, which alters an invariant amino acid residue in the DNA- binding domain of a fork head/winged helix transcription factor, encoded by the gene *FOXP2* (Lai *et al.*, 2001). Dementia is a major risk factor for both feeding problems and dysphagia.

2. Material and Methods

Field survey were done in an around the Central India at various places such as Nagpur, Katol, Umerer, Wardha, Amravati. During study randomly the affected or unaffected male and female of different age group from 8-35 year were observed. The collection of data were based on the different behavioral test such as; Language Test, Intelligence Test, Expressive language Test and physiological basis of affected and unaffected person beside test physiological behaviour were also observed.

3. Result and Observations

Our result shows that out of observed affected and unaffected person with SLP estimated ratio of 100% population on gender bias male shows 4% SLP whereas in female it was resulted into 3% thus overall among observed population 7% affected were shows SLP as a disorder with respect to conducted tests as follows:

3.1 Language Test

During observation it was observed that when the affected person is read literature, we found that during

pronunciations of speech is with hesitation and uninterrupted speech is with low peach discontinuity (Graph 1).

3.2 Intelligence Test

In Intelligence test, affected person were analytically judged and we found that they are unable to solve complex airthmetatic problems either by using modern gadgets like tablets and computer in comparison to normal individual (Graph 2).

3.3 Expressive language Test

In Expressive language test our result shows that a person suffering from aphasia disorder, memory skill and testing were normal perhaps it shows grammatical mistakes in its statements during communication with simultaneous errors in repetitive phrase reading with Literal par aphasia, self correction, numerous pauses, filled pauses – Aaaaa Aaaaa, reading deficit- variable, Nonfluent, limited speech output were resulted (Fig. 1).

4. Conclusion and Discussion

The result reported in this study reveal that the affected person, as a group were impaired on almost every test administrated. This is in accord with the previous report by Vargha-Khadem *et al.*, (1995). However, the result of the comparing affected and unaffected person, demonstrated that performance on attest of repetition for non-words containing complex articulation patterns could alone successfully discrimination the two groups from each other. It is a good candidate, therefore, for a behavioral phenotype of this disorder. Several studies have shown that children with specific language impairment (SLI) have difficulty in repeating non-words which is in accordance with finding of Kohmi, A and Catts, H (1989) and Lewis *et al.*, (1989). The result of these exploratory analyses should be interpreted as suggestive rather than studies of similarly impaired population. Also, the presence of an articulation disorder persisting into parent to offspring some carrier and some are expressive. Non-word repetition impairment (Bishop *et al.*, 1996); impaired phonological working memory (Gathercole and Baddeley, 1990); and protracted use of the optional infinitive (Rice and Wexler, 1996; Rice *et al.*, 1998) also support our findings. It was the first report conducted in our region about SLP disorder our finding able to created awareness among the local people in facing endless problems in community to overcomes all uncertain situations and even though our studies brings us to closer understanding the biological basis of vocal learning and languages.

5. Acknowledgement

Author is thankful to the local people of surrounding village and local community of various religions for their support and effective communication during conducted surveys. We

also thanks to our skills technician Mr. Rahul Kinkar for endless efforts during study.

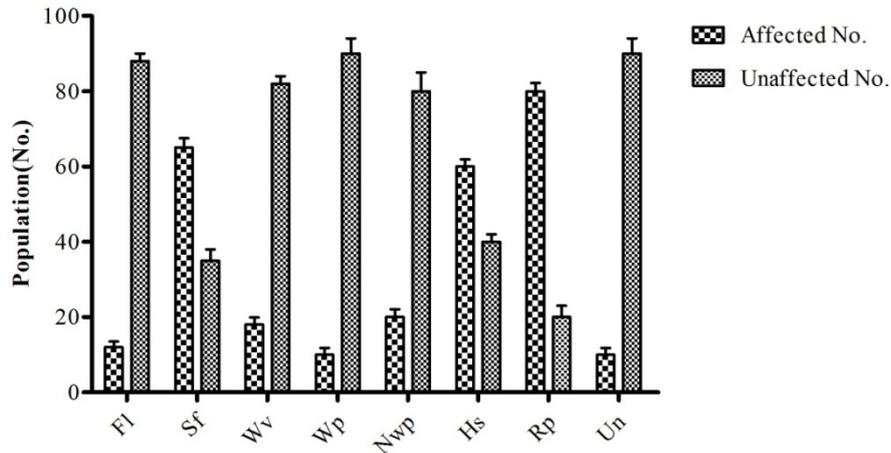
References

- [1] Bishop, D.V, North, T, Donlan, C. (1996) Nonword repetition as a behavioural marker for inherited language impairment: evidence from a twin study. *J. Child Psychol Psychiatry*; 37; 391-403.
- [2] Fisher, S. E, Vargha-Khadem, F, Watkins, K.E, Monaco, A.P, Pembrey, M.E. (1998) Localisation of a gene implicated in a severe speech and language disorder. *Nat. Genet.* 18, 168–170.
- [3] Gathercole, S. E, and Baddeley, A. D (1990) Phonological memory deficits in language disorder children: Is There a Causal Connection?.*J. of memory and language.* 29: 336-360.
- [4] Gupta, A and Singhal, G (2011) Understanding Aphasia in a simplified manner. *Journal of Indian Academy of Clinical Medicine* 12(1); 32-7.
- [5] Haesler, S, Wada, K, Nshdejan, A, Morrisey, E. E, Lints, T, Jarvis, E. D, Scharff, C. (2004) FoxP2 expression in avian vocal learners and non-learners. *J Neurosci* 24:3164 –3175.
- [6] Hauser, M. D, Chomsky, N, Fitch, W. T. (2002). The faculty of language: what is it, who has it, and how did it evolve? *Science* 298:1569 –1579.
- [7] Hurst, J. A. Baraitser, M, Auger, E, Graham, F, Norell, S. (1990) An extended family with a dominantly inherited speech disorder. *Dev. Med. Child Neurol* 32, 352–355.
- [8] Kohmi, A and Catts, H (1989) Toward on understanding of developmental language and reading disorders. *Journal of Speech and Hearing Disorderd.* 51; 337-347.
- [9] Lai, C.S, Fisher, S.E, Hurst, J.A, Vargha-Khadem, F, Monaco, A.P. (2001) A forkhead-domain gene is mutated in a severe speech and language disorder. *Nature* 413:519 –523.
- [10] Lai, C.S, Gerrelli, D, Monaco, A.P, Fisher, S.E, Copp, A.J. (2003) FOXP2 expression during brain development coincides with adult sites of pathology in a severe speech and language disorder. *Brain* 126:2455–2462.
- [11] Lewis, M, Stanger. C, and Sullivan, M.W. (1989) Deception in 3-year olds. *Developmental Psychology*, Vol.25; No.3; 439-443.
- [12] Tomblin, J.B, Records, N, Buckwalter, P, Zhang, X, Smith, E. and O'Brien, M, (1997) Prevalence of specific language impairment in kindergarten children. *Journal of Speech Language and Hearing Research*, 40, 1245–1260.
- [13] Watkins, K.E, Drankers, N.F, and Khadam, F.V. (2002) Analysis of an inherited speech and language disorder comparison with acquired aphasia. *Brain*, 125, 452-464.
- [14] White, S.A, Fisher, S.E, Gaschwind, D.H, Schaff, C and Hdy, T.E. (2006) Singing Mice, Song birds and more: Model for FOXP2 function and dysfunction in human speech and language. *The Journal of Neuroscience.* 26(41): 10376-10379.

Local words English words

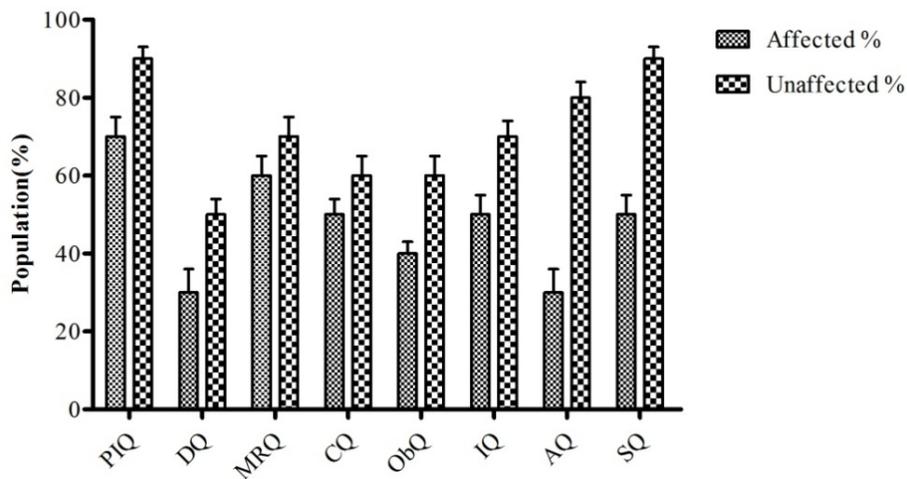
अतततत.....AA
 हहहह.....HH
 रररर.....RR
 सससस.....SaSa
 यययय.....YaYa
 गगगग.....GaGa

Figure 1: Hesitated and uninterrupted words



*Fl-Fluency, Sf-Speech effort, Wv-Word vocabulary, Wp-Word pronunciation, Nwp- Non-word pronunciation, Hs- Hesitation, Rp-Rapid speech, Un- Uninterrupted

Graph 1: Language test



*PIQ- Person intelligianus question, DQ-Diagramatic question, MRQ-Maths Resoning question, CQ-Computer question, ObQ-Objective question, IQ-Information Question, AQ-Arthamatic question, SQ-Similarity question.

Graph 2: Intelliance test