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Case Report

Aphasia, apraxia, and dysphagia following viper envenomation: A single case report

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A R T I C L E I N F O

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A B S T R A C T

Objective: Aim of the work was to highlight unusual complications such as aphasia, apraxia and dysphagia following viper bite.

Method: In this case report, a 55 years old male who had developed Cerebrovascular Accident (CVA) and Right hemiparesis after an hour of saw-scaled viper bite on his right foot was described. His MRI report revealed chronic infarct in bilateral fronto parietal lobe. Difficulty in speaking and swallowing were observed and the patient was under nasogastric feeding. For assessing speech and language skills, Western Aphasia Battery and Apraxia Battery for Adults-2 was used. Manipal Manual for Swallowing Assessment was used for assessing the swallowing skills.

Results: The assessment results indicated that the patient had Broca's aphasia with Non-Verbal oral apraxia and oropharyngeal dysphagia. Improvement was observed in swallowing and verbal communication skills following speech-language intervention.

Conclusion: Aphasia, apraxia and dysphagia were unusual complications following viper bite. Therefore, it is important for a speech language pathologist to have knowledge regarding various causes of stroke for better speech, language and swallowing management

1. Introduction

Snake envenomation is quite usual problem in tropical countries which affect nearly six million people each year, with approximately 10% of these fatalities happening in India.[1] Neurological deficit following viper envenomation is not uncommon. Generally it manifests as intracerebral hemorrhage or subarachnoid hemorrhage.[2] In India, the leading cause of fatal snake bite are viperidae species which consists of Russell's viper (Daboia russelli) and saw scaled viper (Echis carinatus).[3–5] Snake envenomation is a complicated phenomenon. The manifestation of snake envenomation includes hematological, cardiac, renal and neurological abnormality. Though ischemic manifestations such as, acute myocardial infraction or cerebral infraction is quite unusual.[6,7] Snake envenomation leads to a diverse range of clinical effects, ranging from minimal envenomation like itching, pain, puncture wounds and swelling to highly fatal manifestations such as bleeding, shock, hypotension, and renal failure, specifically with viper bites, and respiratory failure and sudden flaccid paralysis in neurotoxic bites.[8] Saw scaled viper envenomation (Echis carinatus) leads to local swelling and severe necrosis of tissue. This manifestation includes hemorrhage in various parts of the body such as gums, nasopharynx, gastrointestinal tract, central nervous system and urinary tract. The neurological traits includes

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drowsiness, convulsions and confusions.[9] There is a dearth of research studies reporting specifically on the speech, language and swallowing deficits that occur following snake bite, hence in this case report we present unusual complications such as aphasia, apraxia and dysphagia following viper bite.

2. Case Report

A case of 55 years old male had developed Cerebrovascular Accident (CVA) and Right hemiparesis after an hour of saw-scaled viper bite on his right foot. His MRI report revealed chronic infarct in bilateral fronto parietal lobe. He had difficulty in speaking and swallowing and the patient was under nasogastric feeding. He had no other history of risk factors such as diabetes mellitus, hypertension, smoking, alcohol consumption. For speech and swallowing evaluation, the patient was referred to Institute of Speech and Hearing, Madras Medical College, Chennai, Tamil Nadu.

2.1. Speech, language and swallowing evaluation

A comprehensive assessment was carried out by the speech language pathologist. The native language of the patient was Tamil. He was right handed, monolingual and completed 10^{th} standard. His hearing skills were normal. During the evaluation, he was conscious, alert and oriented though emotionally unstable. On speech and language evaluation, he had non-fluent speech, impairment in naming, reading, writing, repetition with good auditory and visual comprehension. His mode of communication was Non-Verbal, through gestures and pointing. Oral Peripheral Mechanism Examination was carried out. Western Aphasia Battery[10] is an accepted method for evaluating language skills in many neurological conditions such as stroke.[11,12] In Western Aphasia Battery specifically six subscales of the test which includes spontaneous speech, comprehension, naming, repetition, reading and writing was administered. As a measure of apraxia, subscores from the Apraxia Battery for Adults-2[13] (ABA-2) was used. For swallowing evaluation, Manipal Manual for Swallowing Assessment[14] (MMSA) was used.

3. Results

Oral Peripheral Mechanism Examination revealed lips deviated towards left side with reduced lip closure, poor lip seal; tongue deviated towards right side and restricted lingual movements.

On WAB,[10] the subtest scores were 0 for spontaneous speech, 8.2 for comprehension, 0 for naming, repetition, reading and writing revealing Broca's aphasia.

On Apraxia Battery for Adults (ABA) indicated Non-Verbal oral apraxia.

MMSA scores on motor and sensory assessment were 104 and on phases of swallowing were 19 revealing Dysphagia in oral and pharyngeal phase. He had delayed laryngeal elevation while swallowing thick and thin liquids. Aspiration and cough with expectoration was observed while swallowing saliva and thin liquids. Diminished gag reflex was observed. He was diagnosed as Broca's aphasia with Non-Verbal oral apraxia and oropharyngeal dysphagia.

4. Intervention

The patient has been undergoing speech, language and swallowing intervention for the past one month. Oromotor exercises such as lip stretching, lip closure exercises were given to improve lip seal and labial range of motion. Tongue stretching and strengthening exercises were given to elicit tongue movements and range of motion. Vegetative skills such as blowing and sucking were practiced.

Swallowing facilitation techniques were carried out to manifest adequate swallowing. Diet modification was used starting from spoon thick consistency to thin liquids. Head extension technique was used to drain the food from the oral cavity to the pharynx and oesophagus through gravity. Effortful swallow was done to increase the posterior movement of tongue base during the pharyngeal swallow to improve the clearance of bolus from vallecula. Stimulation was given using food of different tastes and temperatures alternatively to enhance the taste sensation and to elicit the gag reflex.

After a month of follow up, he was able to swallow thick, thin liquids and semi-solids with no aspiration. At present, he is able to maintain good lip seal and tongue movements such as protrusion, retraction and elevation were elicited. Blowing and sucking skills were also established. His MMSA scores were reduced from 104 on sensory and motor assessment to 93 and on phases of swallowing from 19 to 10. Even though intervention was started one year after the snake bite, he has shown marked improvement in oromotor and swallowing skills.

With speech and language intervention, improvements were observed in verbal communication skills. After a month of follow up, he was also able to comprehend complex sentences. He can speak in sentence but grammatical errors were observed.

5. Discussion

Serious neurological abnormalities, including stroke and muscle paralysis, are associated with the toxic effects of the venom. The venom consists of a complex mixture of toxins influencing the neuromuscular transmission, the coagulation cascade, or both.[15] The rich components present in the complex toxin of viper snake venom dominantly affect the hemostatic mechanism.[16] Characteristics of viper bite depend on the envenomation severity and

bleeding manifestations are frequently encountered in clinical practice.[17] In large doses, viper snake venom can lead to massive intravascular coagulation which cause occlusion of small and even large vessel resulting in cerebral infraction.[18] Bashir and Jinkins (1985)[19] reported a patient in whom envenomation with Echis carinatus (saw scaled viper) resulted in cerebral infraction. That patient developed hemiplegia and aphasia (non-fluent aphasia). Polo, Alvarez de Arcaya, Cid, Berciano (2002)[20] reported a farmer who developed sensory aphasia following viper bite. They also mentioned that the patient was eventually improved with treatment conservatively and residual expressive aphasia was the patient's only sequel when last seen. Numeric, Moravie, Didier. Chatot-Henry D, Cirille (2002)[21] reported a patient who developed multiple cerebral infarctions after snake envenomation. He had Partial wernicke's aphasia (including difficulty in repetition of spoken words and also difficulty in simple straightforward commands). Narang, Paleti, Asad, and Samina (2009)[5] reported right hemiplegia and expressive aphasia in a patient following a Russell's viper bite. They also mentioned improvement in motor power and speech in that patient. Chandrashekar Anikethana, and Kalinga (2012)[22] described a patient who developed right hemiplegia with motor aphasia caused due to infract following viper bite. Also, they mentioned that the patient had improved with nominal aphasia. There were other studies which reported expressive aphasia,[23] motor aphasia,[24] mixed aphasia[25] following snake bite.

In our patient he was previously healthy with no significant premorbid history, developed broca's aphasia as a result of cerebral infraction following snake envenomation. To our knowledge, this is the first article to report non-verbal oral apraxia associated with broaca's aphasia following snake envenomation.

Dysphagia is one of the neurotoxic features following snake bite.[26] Bernheim, Lorenzetti, Licht, Markwalder and Schneemann (2001)[27] reported three cases of severe neurotoxicity following snake bite. One of the three patients exhibited dysphagia. Seneviratne and Dissanayake (2002)[28] mentioned that dysphagia is one of the neurological manifestation after snake bite. Similarly, our patient developed oropharyngeal dysphagia following snake envenomation. With swallowing therapy, the patient's swallowing ability was improved, and he was able to continue oral feeding.

6. Conclusion

In snake envenomation, the mechanism through which the cerebral infraction happens can be multi-factorial. The Toxic snake venom contains anti-coagulant and pro-coagulant properties.[29] It can be a possible cause for stroke resulting in aphasia with apraxia as well as dysphagia. Therefore it is important for a speech language pathologist to have knowledge regarding various causes of stroke for better speech, language and swallowing management. The speech, language and swallowing skills have been improved after proper intervention. If the intervention had started earlier, improvement would have been much better.

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8. Conflict of Interest

The author declares that there is no conflict of interest.

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