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Videofluoroscopic Evaluation of Patients with Guillain-Barré Syndrome

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Abstract. We reviewed 14 patients with clinically confirmed Guillain-Barré syndrome for swallowing dysfunction. All had swallowing dysfunction varying from mild to severe. Six patients (43%) had equivalent impairment during oral and pharyngeal phases. Seven patients (50%) had more severe functional abnormalities during the pharyngeal phase than during the oral phase. One patient (7%) had moderate disorder during the oral phase and mild disorder during the pharyngeal phase. Thirty-six percent of the patients had moderate-to-severe dysfunction during the oral phase, and 71% had moderate-to-severe dysfunction during the pharyngeal phase. In 5 patients who had multiple sequential examinations, moderate or severe swallowing disorders improved to mild-to-moderate disorders within 4-8 weeks after the onset of the symptoms. Residual swallowing disorders may be seen in those who had severe swallowing dysfunction during the later phases of their disease. Further investigations are needed to determine if swallowing abnormalities persist after complete recovery from Guillain-Barré syndrome.

Key words: Guillain-Barré syndrome — Oral — Pharyngeal — Deglutition — Deglutition disorders.

Swallowing dysfunction is a common symptom in patients with various neurologic diseases. The general types and the severity of oropharyngeal dysfunction related to neurologic diseases have been addressed [1,2]. Although swallowing abnormalities are thought to be a major problem in patients with Guillain-Barré syndrome, a detailed study of the location, severity, and progressive changes of oropharyngeal dysfunction correlated to the clinical phases of the disease has not been done. The purpose of this investigation was to evaluate and follow swallowing disorders in 14 patients with Guillain-Barré syndrome.

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Materials and Methods

In a 5-year period, 14 hospitalized patients (8 men, 6 women) with Guillain-Barré syndrome were referred for clinical and videofluoroscopic evaluation of swallowing. The mean age of patients was 53 years (range, 19–78 years). All clinical diagnoses were made by a faculty neurologist (PDD) on the basis of clinical evaluation and pertinent studies. All patients met minimum diagnostic criteria for Guillain-Barré [3,4]. All patients had a subacute onset quadriparesis associated with either hyporeflexia or areflexia. The symptoms of swallowing dysfunction varied in severity. Seven patients were being fed by an naso-enteral catheter, 4 were on a puree diet, and 3 were on a soft diet but were having difficulty.

Prior to radiologic evaluation, all patients were assessed clinically by a swallowing therapist, who also attended the videofluoroscopic examination. Six patients had videofluoroscopic examination of swallowing because their pharyngeal status was uncertain by clinical examination. Videofluoroscopic examination was performed and has been described previously [2,5].

Both low- and high-viscosity barium suspensions were used [5]. The low-viscosity suspension was a 1:1 dilution of E-Z-HD (120 wt/vol; E-Z-EM Co., Westbury, NY), with the viscosity of water. The high-viscosity suspension used was undiluted Polibar (100 wt/vol; E-Z-EM Co.) with a viscosity similar to that of syrup. A commercially available barium paste with the consistency of pudding, Esophatrast (100% wt/vol; Armour Pharmaceutical, Blue Bell, PA) was used. The solid material was a piece of cookie (Lorna Doone, Nabisco, East Hanover, NJ) coated with barium paste. All consistencies were given at room temperature. Contrast materials were given sequentially, starting with the low viscosity liquid and progressing to the solid. Each patient initially received 3 ml of the barium suspensions, a similar quantity of paste, and one-quarter of a cookie. Larger amounts (5 ml) of both liquids were then given if aspiration did not occur with the lower

Table 1. Severity of swallowing dysfunction in patients with Guillain-Barré syndrome on their initial clinical and videofluoroscopic examination

	Oral phase[a]				
	Normal	Mild	Moderate	Severe	Total
Pharyngeal phase					
Normal					0
Mild	1	2[a]	1[b]		4
Moderate	1	2	2[a]		5
Severe	2	1		2[a]	5
Total	4	5	3	2	14

[a] Six patients had equal severity during oral and pharyngeal phases.
[b] Only 1 patient had moderate impairment during oral phase and mild impairment in pharyngeal phase. The remaining patients had more severe dysfunction during pharyngeal phase than oral phase.

volume. The examination was stopped if the patient had failure of oral transport function or substantial aspiration.

The severity of oropharyngeal dysfunction was categorized by combined clinical and videofluoroscopic findings [2]. Swallowing dysfunction was considered mild if bolus control and transport were delayed orally or if mild stasis occurred without laryngeal penetration. Dysfunction was deemed moderate if bolus transport was substantially delayed, if stasis occurred with all consistencies, if laryngeal penetration occurred, or if there was mild aspiration with only one consistency. Dysfunction was considered severe if substantial aspiration occurred or if the patient failed to transfer the testing materials and swallow. Swallowing dysfunction was graded separately during oral and pharyngeal phases. The final diagnosis and feeding recommendations were based upon clinical and videofluoroscopic examinations.

Nine patients had initial bedside and videofluoroscopic studies, and 5 received multiple clinical and videofluoroscopic examinations. Two patients had two studies each, 2 had three studies each, and 1 had four videofluoroscopic studies. All sequential studies were performed 2-7 weeks after the initial study.

Results

All patients with Guillain-Barré syndrome referred for swallowing evaluation had oropharyngeal dysfunction. Four patients had pharyngeal dysfunction only and 10 had combined oral and pharyngeal abnormalities. On initial examination, 6 patients had equally severe dysfunction during oral and pharyngeal phases of swallowing. Dysfunction was classified as mild in 2 patients, moderate in 2, and severe in 2 (Table 1). Seven patients had more severe abnormalities during the pharyngeal phase than during the oral phase; for example, 2 had normal oral function and severe pharyngeal dysfunction. One patient had moderate oral dysfunction with mild pharyngeal dysfunction. Five patients (36%) had moderate or severe dysfunction during the oral phase, and 10 patients (71%) had moderate or severe abnormalities during the pharyngeal phase.

All patients except 1 had initial videofluoroscopic evaluation 1-4 weeks after the onset of their symptoms; 1 patient was evaluated 40 weeks after the onset of his symptoms because of a prolonged recovery.

Of the 5 patients who had multiple videofluoroscopic studies, 2 with severe pharyngeal dysfunction improved to only mild abnormalities 3-7 weeks after their initial study or 4-8 weeks after the onset of symptoms. In 2 other patients, severe pharyngeal dysfunction regressed to moderate dysfunction 2-6 weeks after the first examination or 5-8 weeks after the onset of symptoms. One final patient with moderate pharyngeal dysfunction improved to mild pharyngeal abnormalities 1 week after the initial study.

Discussion

Guillain-Barré syndrome is an acquired, multifocal demyelinating condition of the peripheral nervous system usually affecting motor more than sensory function. Clinically, patients have quadriparesis of varying severity associated with mild sensory deficits. Cranial nerve involvement in Guillain-Barré syndrome may affect facial, ocular, or orophryngeal muscles and may lead to swallowing difficulty. The clinical course of the disease can be divided into progressive, plateau, and recovery phases. The mortality rate is approximately 6% [6,7].

The major cause of swallowing difficulty in patients with Guillain-Barré syndrome is varying degrees of impairment of multiple cranial nerves. The motor division of the trigeminal nerve controls mylohyoid function which affects laryngeal elevation and prevention of aspiration. The hypoglossal nerve regulates function of the tongue and involvement contributes to oral control and transport problems. Other cranial nerves between the fifth and twelfth may be involved. The overall incidence of swallowing difficulty in Guillain-Barré syndrome is uncertain, but 90% of patients with severe disease are affected with swallowing problems during the progressive phase and all of these patients in the plateau phase [6].

The severity of oropharyngeal dysfunction depends on the extent of pharyngeal muscle involvement

and the time between the onset of symptoms and swallowing evaluation. In one study [6], the mean progressive phase lasted 12 days; the plateau phase also lasted about 12 days, and the recovery phase averaged 568 days [6]. In our series, most patients with severe swallowing dysfunction recovered within 4-5 weeks after the onset of symptoms. However, in 1 patient, swallowing dysfunction was severe for 6 weeks during three repeated videofluoroscopic examinations, and 8 weeks later swallowing dysfunction had improved to the moderate level. Based upon our data, the initial clinical and videofluoroscopic evaluations are best performed during the progressive or plateau phase, and follow-up evaluation is advised during the recovery phase, about 4-8 weeks after the onset of symptoms.

In one clinical study [8], 35% of the patients recovered completely, 35% had minimal residual motor signs, and the remaining 30% had residual paresis at follow-up 2-24 years later. A significant positive correlation was found between the degree of residual motor deficit and the severity of the weakness in the acute phase [8]. Patients who had severe paresis during the acute phase and longer duration of the plateau phase are expected to have more residual signs [8]. In our series, most patients with mild or moderate swallowing dysfunction, in either the oral or the pharyngeal phase, recovered clinically and there was no need for videofluoroscopic follow-up examination. However, 4 patients with severe pharyngeal dysfunction during the initial study had residual mild or moderate swallowing disorders during follow-up videofluoroscopic evaluation 4-8 weeks later. Patients with severe swallowing dysfunction during the progressive or plateau phase may have residual swallowing disorders during the clinical recovery phase.

Aspiration is a serious symptom in patients with Guillain-Barré syndrome but may not be identified clinically in nearly half of patients who aspirate [9]. Of the 6 patients in our series who had uncertain pharyngeal function at bedside examination, videofluoroscopic examinations showed mild disorder in 1, moderate disorder in 3, and severe disorder in 2. In our series, no patient with severe swallowing dysfunction and potential aspiration developed aspiration pneumonia. Videofluoroscopy is the appropriate modality to evaluate pharyngeal dysfunction and is especially useful for demonstrating potential silent aspiration that may be undetected during clinical examination.

In patients with Guillain-Barré syndrome, swallowing disorders were less severe during the oral phase than during the pharyngeal phase. Oral dysfunction can be evaluated by either clinical examination or videofluoroscopy. However, pharyngeal dysfunction is better evaluated by videofluoroscopic examination. Swallowing disorders that appear during the progressive and plateau phases in patients with Guillain-Barré syndrome may improve during the recovery phase. Residual swallowing disorders may be present in those who had severe swallowing dysfunction during progressive and plateau phases clinically.

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