Nutritional Correlates of Dysphagia in Individuals Institutionalized with Mental Retardation

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Abstract. We report on a study of the relationships between swallowing adequacy in institutionalized, severely and profoundly retarded subjects and selected nutritional status and nutritional risk factors. Dysphagic persons differed from nondysphagic persons with respect to an index of body mass, need for therapeutic diets, and frequency of selected illnesses and disorders. There were no differences in serum iron and protein levels or intake factors that included food allergy restriction and medications associated with dysphagia. Body mass index was the best predictor of severity of dysphagia in this population.

Key words: Nutritional status – Mental retardation – Dysphagia, nutritional risk factors.

Estimates of the prevalence of oral and pharyngeal dysphagia among the institutionalized mentally retarded have varied depending on the criteria used to define the problem and the overall severity of involvement of the population [1]. Vanadzin [2] found that 10% of one institution's residents presented with choking problems in a 12 month period. McKrensky [3] found 33% with chewing and swallowing problems. Sheppard et al. [1] found 97% of a severely and profoundly retarded population to have deficient control of oral secretions and/or ingestion of foods, with impaired oral preparatory, oral, or pharyngeal phase dysphagia. These individuals had been recently transferred from an institution where they had received limited medical and rehabilitation services [4]. A survey that examined mealtime ingestion of foods in a similar population of severely and profoundly mentally retarded individuals in an institution with active nutritional and dysphagia management programs found 49.4% to have one or more symptoms of dysphagia [5]. The lower incidence was attributed to therapeutic programs and environmental management that led to successful compensation in the less severely involved dysphagic persons and elimination of control of oral secretions from the survey items.

Mentally retarded individuals are considered at high risk for nutritional problems [6, 7]. Impaired oral preparatory, oral, and pharyngeal stage dysphagias have been suggested to be one of the factors contributing to that risk [1, 3, 7, 8]. However, specific interactions between dysphagia, nutritional status, and other nutritional risk factors have not been examined. Our study was designed to examine these relationships.

Method

One hundred eight adult subjects were selected from the total population of 627 residents at a state-supported institution for the severely and profoundly mentally retarded. Subjects were selected on a nonrandom basis by age, gender, and dysphagia diagnosis. Age was included as a variable because of reported effects of age on swallowing function [9]. Sex distribution was controlled as much as possible, within the limits of the population pool, to mitigate gender bias. Diagnosis of dysphagia was based on mealtime examination of each client by staff speech pathologists who were experienced in evaluating and treating swallowing disorders in this population. Subjects were classified by age into two groups with dysphagia and two groups of nondysphagia subjects. Table 1 describes the subject groups.

In order to maximize the contrast between the dysphagic and nondysphagic groups, subjects with the most and least adequate swallowing function were selected preferentially. Degree of swallowing adequacy was determined by the subject's score on the Dysphagia Disorders Survey, a screening instrument for the occurrence and severity of dysphagia [5]. The survey
Table 1. Subject groups

<table>
<thead>
<tr>
<th>Group</th>
<th>n</th>
<th>Males</th>
<th>Females</th>
<th>Age (years): M(SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nondysphagic</td>
<td>58</td>
<td>20</td>
<td>28</td>
<td>33.91 (7.99)</td>
</tr>
<tr>
<td>Young</td>
<td>23</td>
<td>11</td>
<td>12</td>
<td>26.00 (2.70)</td>
</tr>
<tr>
<td>Old</td>
<td>35</td>
<td>19</td>
<td>16</td>
<td>39.11 (5.66)</td>
</tr>
<tr>
<td>Dysphagic</td>
<td>50</td>
<td>27</td>
<td>23</td>
<td>33.82 (8.72)</td>
</tr>
<tr>
<td>Young</td>
<td>20</td>
<td>10</td>
<td>10</td>
<td>25.80 (3.58)</td>
</tr>
<tr>
<td>Old</td>
<td>30</td>
<td>17</td>
<td>13</td>
<td>39.17 (6.80)</td>
</tr>
</tbody>
</table>

Table 2. Dysphagia Disorders Survey format

Mealtime considerations
- Diet: Pureed, ground, or cut-up solids
- Feeding independence: Dependent, assisted, or independent eater
- Adaptive equipment: Use of special spoons, cups, etc.

Positioning
- Body postural control: Head-neck and trunk stability
- Need for assistance: Body or head stabilization during feeding

Ingestion analysis
- Food types eaten at meal: Nonchewable solid, chewable solid, or liquid
- Oral preparatory phase swallow
  - Orienting: Alerting to, and postural adjustments for, approaching bolus
  - Reception: Removing food from utensil with mouth and biting
  - Containment: Containing food in mouth during oral transit and processing
  - Oral transit: Moving food through mouth and emptying mouth during swallow
  - Chewing: Complete mastication of bolus
- Oral and pharyngeal phase
  - Initiation of swallow: Prompt swallow at conclusion of processing and transit
  - Breath sounds: Clear breathing during and following eating
  - Protective reflex responses: Occurrence of coughing, gagging, or sneezing

includes consideration of neuromotor factors associated with deglutition, such as body postural control for mealtime, oral management of nonchewable and chewable solid and liquid foods, symptoms of impaired posterior containment and pharyngeal transit, and related factors that may be associated with dysphagic involvement, such as diet consistency, use of adaptive utensils, feeding independence, and mealtime compliance [10, 11]. The Dysphagia Disorders Survey is presented in Table 2.

In order to assess nutritional status, each subject's health records were reviewed for factors considered to reflect their nutritional condition, directly or indirectly, in the immediately preceding 12-month period. Body mass index (BMI) was used to evaluate caloric nutrition. The BMI is a generally accepted standard for estimating body composition and has also been related to mortality risk [4, 12]. The blood chemistry measures selected to indicate iron and protein serum levels were hemoglobin, mean corpuscular volume (MCV), and serum albumin.

Need for therapeutic adjustments of diet content with respect to calories, consistency, and special supplements was included as an indirect indication of nutritional status. Additional indirect indicators were charted notations on adequacy of the subjects' weight and food intake, need for vitamin-mineral supplements, and use of medications that have been associated with dysphagia [8, 13], infection, gastroesophageal reflux, GI order, and constipation. Total lymphocyte count was included as a general indicator of chronic infection and malnutrition [14]. Occurrence of esophageal, gastric, intestinal, and rectal disorders, and anorexia were noted because of their association with nutritional risk and with occurrence of pharyngeal and esophageal phase dysphagias.

Survey items were clustered for scoring and statistical analysis using Chronbach's alpha analysis [15]. The BMI was calculated for each subject. A score was derived for each cluster of nutritional survey items by summing the number of fail