American Journal of Nursing Science
2020; 9(6): 442-444
http://www.sciencepublishinggroup.com/j/ajns
doi: 10.11648/j.ajns.20200906.20
ISSN: 2328-5745 (Print); ISSN: 2328-5753 (Online)

Analysis on the Effect of Early Screening and Safe Management of Dysphagia in Scleroderma Patients

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To cite this article:
Yingfeng Huang, Guiyan Wen, Xia Huang, Xiaozhen Huang. Analysis on the Effect of Early Screening and Safe Management of Dysphagia in Scleroderma Patients. *American Journal of Nursing Science*. Vol. 9, No. 6, 2020, pp. 442-444. doi: 10.11648/j.ajns.20200906.20

Received: November 25, 2020; **Accepted**: December 4, 2020; **Published**: December 11, 2020

Abstract: Objective: To analyze the effect of early screening and safe management of dysphagia in scleroderma patients. Methods: From January 2016 to January 2020, a randomized controlled trial was performed with scleroderma patients (n = 42) who were diagnosed as scleroderma. In intervention group, the participants are accepted early screening and safe management of swallowing disorders. The participants of control group are accepted common nursing service. Result: the 48.84% of participants have problems in swallowing process, most participants provide assessment of level 2 of WST. In swallowing test assessment, more participants think they feel obstruction when eating steamed bread. The accident aspiration pneumonia has higher risk than that of aspiration pneumonia in two group (10.00% vs 3.75% & 37.50% vs 23.75%). In research of swallowing function treatment, most participants of intervention group are basic recovery in treatment outcome, the control group have most invalid assessment in treatment outcome. Conclusion: the early screening and safe management of dysphagia can efficacy improve scleroderma dysphagia of scleroderma patients. In dysphagia problem, the scleroderma patients have higher risk of accident aspiration, and the early screening and safe management of dysphagia can improve problems of accident aspiration and aspiration pneumonia. Additionally, the early screening and safe management of dysphagia have strong effect for dysphagia.

Keywords: Scleroderma, Dysphagia, Nursing Intervention

1. Introduction

Scleroderma is a connective tissue disorder from autoimmune inflammatory, it results in the sclerosis, or fibrous hardening, of the skin and sometimes the internal organs [1]. Additionally, the patient's blood vessels may also be affected in the systemic scleroderma, the scleroderma lead to endothelial injury resulting in microangiopathy [2]. It has 3 pathogenesis, that includes skin tightening, small blood vessel involvement, and collagen overproduction in various internal organs [3]. Base on esophageal manometry report, nearly 90% of scleroderma patients presented with reduced esophageal sphincter tension and/or significantly lower esophageal creep. Abnormal gastrointestinal motility can lead to dysphagia, gastroesophageal reflux, satiety, pseudo obstruction [4].

The dysphagia was defined as a difficulty swallowing foods and/or liquid or to the sensation that foods and/or liquids become obstructed on their transit from the mouth to the stomach [5]. In the most common consequences of dysphagia, the patients have many serious problems, that include malnutrition, dehydration, recurrent cough, aspiration pneumonia, choking, limited quality of life, social isolation, increased mortality and morbidity rate [6, 7]. The scleroderma patients suffer higher risk as they have dysphagia, they are easier to experience complications such as malnutrition, dehydration or aspiration pneumonia, they need more residential care setting [8, 9]. The aim of this study was analyzing on the effect of early screening and safe management of dysphagia in scleroderma patients.

2. Methods

2.1. Participants Enrollment and Survey Methods

From January 2016 to January 2020, a randomized controlled trial was performed with scleroderma patients (n = 42) who were diagnosed as scleroderma. The patients were regularly seen at rheumatology and immunology department of the First Affiliated Hospital of Jinan University, and their diagnosis according to the Chinese diagnostic criteria for scleroderma [10]. 42 patients were randomly divided into intervention groups and control group, the participants of two groups are accept water swallow test (WST) in study. In intervention group, the participants are accepted early screening and safe management of swallowing disorders. The participants of control group are accepted common nursing service.

WST is a cost-effective bedside screening tool to detect dysphagia in clinical practice [11, 12]. Base on the report, sensitivity of WST for aspiration ranged from 34.8 to 55.7%, its specificity ranged from 78.9 to 93.2%. Our study assesses participants based on from 2mL of water swallowing to 30 mL of water swallowing.

In safe management of dysphagia, the intervention contrasts related health education and safe eating management. The investigators explained to the patients and their families the influence of abnormal swallowing function on the safety of eating and the methods and importance of preventing the occurrence of aspiration. In addition, we not only provide guidelines and standards for safe eating to patients but also provide safe eating care for patients. The safe eating care include: (1) Make sure the patient has no loose teeth before eating; (2) Compensatory methods of changing postures and postures; (3) Choose the right foods which have suitable quality and character; (4) Assess eating food safety.

2.2. Statistical Analysis

Our data analyzer performed the statistical analysis by SPSS 22.0. The P value, t-test and chi-square test were associated with collection result were analyzed. Besides, the mean standard deviation for statistical description.

3. Result

Table 1. *Results of swallowing function screening and feeding assessment result.*

Abnormal swallowing results	Cases (n)	Percent (%)
Level 2 of WST	8	18.60
Level 3 of WST	6	13.95
Level 4-5 of WST	2	4.6
Having difficulty swallowing steamed bread	2	4.6
feeling obstruction when eating steamed bread	3	6.5
Total	21	48.84

WST = water swallow test

In Table 1, it shows results of swallowing function screening and feeding assessment result, they include assessment result of level 2-5 of WST and swallowing test assessment. In total, the 48.84% of participants have problems in swallowing process, most participants provide assessment of level 2 of WST. In swallowing test assessment, more participants think they feel obstruction when eating steamed bread.

We make the statistics and analysis to assess accident aspiration and aspiration pneumonia between the intervention group and control group (Table 2). The accident aspiration pneumonia has higher risk than that of aspiration pneumonia in two group (10.00% vs 3.75% & 37.50% vs 23.75%). In addition, the risk of accident aspiration pneumonia and risk of aspiration pneumonia in intervention group are much less than control group.

Table 2. *The incidence of accident aspiration and aspiration pneumonia was compared between the two groups.*

Projects	Accident aspiration pneumonia	aspiration pneumonia
Intervention group (n = 21)	10.00%	3.75%
Control group (n = 21)	37.50%	23.75%

In Table 3, it indicates the result of effect of swallowing function treatment in 2 groups, it contrasts 3 levels assessment. Compare with intervention group and control group, most participants of intervention group are basic recovery in treatment outcome, the control group have most invalid assessment in treatment outcome.

Table 3. *The effect of swallowing function treatment in 2 groups was compared.*

Projects	Basic recovery	effective	invalid
Intervention group (n = 21)	38.50%	18.00%	5%
Control group (n = 21)	17.50%	21.25%	41.25%

4. Discussion

Scleroderma is an autoimmune rheumatic disease, the patients suffer substantial damage of vascular system, tissue fibrosis and accumulation of collagen in skin [13]. it is a disease in which hardening of skin and connective tissue occurs either locally or all over the body. In scleroderma, scleroderma has been classified into localized and systemic [14]. Despite of the details of its pathogenesis remain unclear, its characteristics are pro-inflammatory cytokines, autoimmunity, and high levels of autoantibodies contribute to micro-vascular damage, inflammation, and fibrosis [2, 15]. The dysphagia is a potential safety problem in scleroderma, the patients have risk of choking to death while eating. We not only identified the biggest risk factors for swallowing problems, but also evaluated the role of early screening and safe management of dysphagia in swallowing problems.

According to the above results, the early screening and safe management of dysphagia can efficacy improve scleroderma dysphagia of scleroderma patients. Base on Table 1, the 48.84% of scleroderma patients have dysphagia problems, it means that the most scleroderma patients are difficult to eat in their life, it also is a serious clinical problem. The Table 2 indicates the dysphagia problems which from more scleroderma patients are accident aspiration, not aspiration pneumonia. In addition, the participants who receipt early screening services

and safe management of dysphagia are safety in dysphagia, they have lower risk than that of participants who receipt common intervention service. According to the result of swallowing function treatment, the intervention group participants have better outcome of swallowing function treatment than that of control group participants. Thus, the early screening and safe management of dysphagia have good effect for swallowing of scleroderma patients. In similar, Hu had similarly research result for our study, that early screening service can improve the dysphagia problems of scleroderma patients. But he did not use safe management of dysphagia to improve swallowing function of scleroderma patients [16].

5. Conclusion

In conclusion, the early screening and safe management of dysphagia can efficacy improve scleroderma dysphagia of scleroderma patients. In dysphagia problem, the scleroderma patients have higher risk of accident aspiration, and the early screening and safe management of dysphagia can improve problems of accident aspiration and aspiration pneumonia. Additionally, the early screening and safe management of dysphagia have strong effect for dysphagia.

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