Original Article

Frequency of Plummer Vinson Syndrome in Patients with Dysphagia

Khansa Tariq, Danish Hassnain, Hafiz Sajjad Hyder, & Kashif Nawaz

ABSTRACT

Objective: To evaluate the frequency of Plummer–Vinson syndrome (PVS) in patients who present with dysphagia.

Methodology: After ethical approval, this cross-sectional study was conducted in the Department of ENT, Allied Hospital, Faisalabad, from July 2021 to January 2022. Patients aged 20 to 60 years who complained of difficulty in swallowing for more than two weeks were enrolled. Patients with dysphagia due to neurological causes or malignancy of the upper digestive tract were excluded. Each patient underwent barium swallow scan and CBC to evaluate for esophageal webs and iron deficiency anemia. Data was analyzed in SPSS version 25, and p less than or equal to 0.05 was considered statistically significant.

Results: The mean age of patients was 37.75 ± 8.35 years. 61% of the cases were within 20 to 40 years of age range. Females were 74.9% of the study population (M:F ratio 1:2.9). The mean duration of symptoms was 5.93 ± 1.46 weeks. Plummer–Vinson syndrome was identified in 24 (8.14%) patients and there was higher prevalence among females (p=0.048).

Conclusion: Plummer–Vinson syndrome is not uncommon among patients who present with dysphagia, and it occurs predominantly in females. Early screening for iron deficiency and timely intervention can prevent complications and malignant progression.

KEYWORDS: Dysphagia, Esophageal Webs, Iron Deficiency, Plummer–Vinson syndrome

INTRODUCTION

Dysphagia or difficulty in swallowing refers to any difficulty in process of swallowing food or liquids from the mouth to the stomach. It is a frequently occurring symptom and is commonly encountered complaint in clinical practice especially in otorhinolaryngology. It can occur due to neuromuscular dysfunction or physical blockage within the upper gastrointestinal tract.[1] Nutritional deficiencies often present with mucocutaneous signs such as a smooth tongue, angular cheilitis, and brittle nails which are indicators of epithelial atrophy associated with poor nutrition.[2] Plummer–Vinson syndrome (PVS) is one of the most common causes of dysphagia.[3] It was also termed as Patterson–Brown–Kelly syndrome. It consists of triad of symptoms which include progressive dysphagia, iron deficiency anemia and post-cricoid esophageal webs. The exact pathophysiology is not established but it is believed that iron deficiency anemia leads to atrophic changes in oropharyngeal mucosa which in turn leads to development of thin mucosal webs which physically obstructs the upper esophageal tract.[4]

In the developed countries, PVS is relatively uncommon due to improved hygiene and diet.[5] However, it is prevalent in developing countries especially in women of reproductive age group who have nutritional anemia.[6] This syndrome is of grave

Khansa Tariq,[1] *MBBS, FCPS*
Senior Registrar
Danish Hassnain,[2] *MBBS, FCPS*
Senior Registrar
Hafiz Sajjad Hyder,[3] *MBBS, FCPS*
Associate Professor
Kashif Nawaz,[4] *MBBS, FCPS*
Assistant Professor
[1,2,4]Aziz Fatimah Medical & Dental College, FSD, PAK.
[3]Faisalabad Medical University, FSD, PAK.

Correspondence
Dr. Khansa Tariq
khansatariq21@gmail.com

concern, as it is also associated with increased risk of squamous cell carcinoma of hypopharynx and upper esophageal tract.[7] Pakistan is a developing country, and factors such as recurrent blood loss, dietary limitations and poor nutritional supplementation contribute to the higher prevalence of PVS. There has been a lack of proper research on PVS in this region. Therefore, this study was conducted to determine the frequency of PVS among patients presenting with progressive and persistent dysphagia in a tertiary care hospital.

METHODOLOGY

A cross-sectional descriptive study was performed in the Department of ENT, Allied Hospital, Faisalabad, from 19 July 2021 to 18 January 2022. Ethical clearance was obtained from the Institutional Review Board (Approval No. ENT/2021/07). A total of 295 cases were selected through consecutive sampling, based on the WHO sample size formula using 95% confidence level, 5% estimated prevalence, and 2.5% absolute precision.[14] Patients of either sex, aged 20–60 years, presenting with dysphagia persisting for more than two weeks, were included in the study. Patients with neurological causes of dysphagia and with malignancy of the oropharynx, hypopharynx, or esophagus were excluded from the study.

After obtaining informed consent, all eligible patients underwent barium swallow radiography at the Radiology Department and blood sampling in the Pathology Department. A diagnosis of Plummer–Vinson syndrome (PVS) was made when both iron deficiency anemia and esophageal webs were confirmed.[8]

Data were entered and analyzed using SPSS version 25. Quantitative variables such as age and symptom duration were expressed as mean ± standard deviation (SD). Qualitative variables, including gender and presence of PVS, were presented as frequencies and percentages. Chi-square testing was used to assess associations between categorical variables, with $p \leq 0.05$ regarded as statistically significant.

RESULTS

The age range of the patients was 20–60 years with a mean of 37.75 ± 8.35 years. The majority (61.0%) were in the 20–40-year age group. There were 74 males (25.1%) and 221 females (74.9%), giving a male-to-female ratio of 1:2.9 (Table I, II). Mean symptom duration was 5.93 ± 1.46 weeks.

Table I Age Distribution of Patients (n = 295)

Age Group (years)	Frequency	Percentage
20–40	180	61.0
41–60	115	39.0

Plummer–Vinson syndrome was identified in 24 (8.14%) of the 295 patients (Table III). Female gender was significantly associated with a higher frequency ($p = 0.048$) (Table IV), whereas no significant association was found with age or symptom duration.

Table II Gender Distribution of Patients

Gender	Frequency	Percentage
Male	74	25.1
Female	221	74.9

Table III Frequency of Plummer-Vinson Syndrome

PVS	Frequency	Percentage
Present	24	8.14
Absent	271	91.86

Table IV Stratification of Plummer-Vinson syndrome with respect to gender

Gender	Plummer-Vinson syndrome		p-value
	Yes	No	
Male	02 (2.70%)	72 (97.30%)	**0.048**
Female	22 (9.95%)	199 (90.05%)	

DISCUSSION

Our study showed that 8.14% of patients presenting with dysphagia were diagnosed to have Plummer–Vinson syndrome. These results are in accordance

with the past researches which show prevalence of Plummer–Vinson syndrome (PVS) to be 5% to 10%.[5,6] The higher prevalence was observed among female patients which emphasizes the hypothesis that nutritional iron deficiency and pregnancy related iron depletion may be contributory factors in the development of PVS among females. Iron deficiency can cause epithelial thinning and mucosal atrophy, leading to web formation that results in physical blockage of esophageal lumen. This is also evident from the improvement of symptoms after correction of iron deficiency, which shows that it is a reversible mucosal pathology. Early detection can therefore be beneficial for prevention of malignant progression.[8,9,10] This predominance among females is consistent with previous studies which have shown similar results. This shows the impact of menstrual blood loss, malnutrition, and limited access to iron-rich foods.[11] Regional studies from Pakistan and India also show similar gender and age distributions.[12]

The importance of early detection of PVS also lies in the fact that it shows association with squamous cell carcinoma of the esophagus, which is probably due to chronic epithelial and metaplastic changes in esophageal webs.[13] This shows that timely detection, iron supplementation, and regular endoscopic evaluations are vital for the prevention of malignancy.

CONCLUSION

Plummer–Vinson syndrome was identified in nearly one in twelve patients presenting with dysphagia, showing a clear female preponderance. The results emphasize the importance of routine hematologic screening and radiologic assessment in dysphagic patients to enable early detection and management, thereby preventing long-term complications, including malignancy.

***Financial Disclosures*:** None
***Conflict of Interest*:** None

REFERENCES

1. Chtourou L, Moalla M, Gdoura H, Smaoui H, Khrouf O, Kallel R, et al.Clinical and therapeutic features of Plummer-Vinson syndrome in a Tunisian population: a case series. Pan Afr Med J. 2023 Dec 5;44(1):21. doi:10.11604/pamj.2023.44 .21.35809.
2. Mamzhi Y, Sukov R, Kamboj AK. Plummer-Vinson syndrome: classic triad of iron deficiency anemia, dysphagia, and esophageal webs. Clin Gastroenterol Hepatol. 2024;22(12): A23-4. doi: 10.1016/j.cgh.2024.05.035.
3. Harmouch F, Liaquat H, Chaput KJ, Geme B. Plummer-Vinson syndrome: a rare cause of dysphagia in an octogenarian. Am J Case Rep. 2021 Apr 24;22:e929899-1. doi:10.12659/AJCR.929 899.
4. Sajida S, Rai D, Qayum A, Tahir M, Iftikhar U, Bhatti S. Frequency of Plummer–Vinson syndrome in patients presenting with dysphagia in ENT Department Nishtar Hospital. J Popul Ther Clin Pharmacol. 2025;32(4):1100-1105. doi:10.53555/ ms52jr48
5. Wakeel N, Akhtar M, Tariq A, Gull I, Hafeez H, Anjum N. Determining the frequency of Plummer Vinson syndrome among patients having dysphagia presenting at district Bahawalpur. J Univ Med Dent Coll. 2022;13(4):489-92. doi:10.37723/jumdc.v13i4.698.
6. Vohra WI, Sadiq K, Iqbal M, Rehman AU. Plummer–Vinson syndrome: a rare occurrence in paediatrics. BMC Pediatr. 2024 Apr 27;24(1):278. doi: 10.1186/s12887-024-04750-x
7. Alfaris A, Alamri GA, Kurdi AM, Mallisho A, Al Awaji N. Could Plummer–Vinson syndrome be associated with celiac disease? Int Med Case Rep J. 2023 Dec 31:425-431. doi:10.2147/IMCRJ.S415775
8. Pueringer J, Garrard E, Love J, Lipowska AM. Plummer-Vinson syndrome in a Pakistani woman: a case report. Cureus. 2025;17(5):e83530. doi: 10.7759/cureus.83530.
9. Luqman M, Akhtar S, Ramzan MA, Afzal A, Naeem SH, Yawar W. Plummer-Vinson syndrome: a case report. J Liaquat Natl Hosp. 2023;1(2):107-10. doi:10.37184/jlnh.2023.v1i2.107-110
10. Patel K, Kassir M, Patel M, Eichorn W. Plummer-Vinson syndrome in an African- American woman. Case Rep Gastroenterol.2021;15(2):557-61. doi: 10.1159/0005169 37
11. Binet Q, Delorme A. Plummer–Vinson Syndrome. N Engl J Med. 2024 Feb 15;390(7):652. doi:10.1056/NEJMicm2309721. Epub 2024 Feb 10.
12. Lipshutz SH, Lichtenstein S, Truscello DJ, Reddy P. S2435 A rare case of Plummer- Vinson syndrome treated with pneumatic dilations and iron supplementation. Am J Gastroenterol. 2022 Oct 1;117(10S):e1626-627. doi:10.14309/01.ajg.0000868840.407 42.74
13. World Health Organization. WHO sample size calculator for health studies Geneva: WHO; Available from: https://www.who. int/tools/sample-size-calculato

Author Contributions:

Khansa Tariq: Conceived the study designed, carried out the data collection and statistical analysis and drafted the manuscripts.

Danish Hussnain: Conceived the study designed, carried out the data collection and statistical analysis and drafted the manuscripts.

All authors are equally accountable for research work

Hafiz Sajjad Hyder: Conceived the study designed, carried out the data collection and statistical analysis and drafted the manuscripts.

Kashif Nawaz: Conceived the study designed, carried out the data collection and statistical analysis and drafted the manuscripts.

Date of Submission: 01-06-2025
Revised Date: 01-08-2024
Accepted Date: 10-10-2025