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RESEARCH ARTICLE

A CROSS-SECTIONAL STUDY EVALUATING THE ASSOCIATION OF PATIENT LITERACY WITH THE STAGE OF PENILE CARCINOMA

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Abstract

Background: Penile carcinoma is a rare and often late-diagnosed malignancy associated with advanced-stage presentation and poor prognosis. Health literacy, the ability to understand and apply health information, is crucial in healthcare-seeking behavior and early diagnosis.

Methods: This cross-sectional study, conducted over 12 months at a tertiary care center, included 150 patients diagnosed with penile carcinoma. Patient literacy was categorized into four levels based on educational background. Data on demographic and clinical variables, such as age, smoking status, circumcision status, HPV infection, and the time to medical consultation, were collected. The TNM classification system was used to determine the disease stage.

Results: Lower patient literacy levels were significantly associated with an increased likelihood of advanced-stage penile carcinoma presentation ($p < 0.001$). Patients with limited literacy, particularly those with "No Education," exhibited longer delays in seeking medical attention, contributing to the advanced stage at diagnosis. Additional factors, such as circumcision status and the time to medical attention, were also linked to disease stage.

Discussion: This study underscores the critical role of health literacy, categorized into distinct educational levels, in penile carcinoma presentation. Patients with lower literacy levels face barriers to recognizing symptoms and seeking timely medical attention, ultimately resulting in advanced-stage diagnosis. The findings highlight the need for tailored health education and awareness campaigns, especially in communities with varying educational backgrounds.

Conclusion: Patient literacy is associated with advanced-stage penile carcinoma presentation. Addressing disparities in health literacy and promoting awareness of penile carcinoma symptoms may enhance early diagnosis and treatment outcomes. The study emphasizes the multifaceted nature of cancer risk factors, underlining the importance of considering cultural and healthcare-related elements in future research and public health efforts.

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Introduction:-

Penile carcinoma, a malignancy of the penis, represents a rare but challenging urological condition with significant global disparities in incidence and outcomes. While less common than other cancers, it profoundly impacts patients' quality of life and life expectancy, particularly in resource-constrained settings.(1) A primary challenge in addressing penile carcinoma is its often late diagnosis, frequently at an advanced stage, resulting in limited treatment options and poor prognosis.(2)

The incidence of penile carcinoma varies significantly worldwide. Higher rates are observed in less developed regions, including parts of South America, Asia, and sub-Saharan Africa. In contrast, lower incidence rates are reported in developed countries, such as the United States and European nations.(3)Various factors influence these epidemiological disparities, including cultural practices, socioeconomic conditions, healthcare access, and disease awareness.(4)

The clinical presentation of penile carcinoma often includes localized symptoms, such as penile masses, ulcers, or pain. However, despite these potentially alarming signs, a substantial number of patients delay seeking medical attention until their disease reaches an advanced stage.(5) Advanced-stage penile carcinoma is typically defined as stage III (involvement of regional lymph nodes) or stage IV (distant metastasis). It is associated with a poorer prognosis and decreased survival rates.(6)

Health literacy is a crucial yet often overlooked determinant of early diagnosis and appropriate management. Health literacy refers to an individual's ability to understand, access, and apply health information in the context of healthcare decisions. Adequate health literacy enables individuals to comprehend the significance of symptoms, seek timely medical attention, and make informed choices regarding healthcare.(7)

While health literacy has been extensively studied in the context of other diseases, its influence on the presentation stage of penile carcinoma remains understudied. Given the late diagnosis and advanced-stage presentation of this malignancy, understanding the role of health literacy is crucial. Lower health literacy might lead to misinterpretation of symptoms, delayed medical consultation, and ultimately, a more advanced stage at diagnosis.

In light of this, our hypothesis for this cross-sectional study is that patients with lower health literacy levels are more likely to present with advanced-stage penile carcinoma. We aim to investigate the association between health literacy and disease stage, focusing on understanding how health literacy may influence the presentation stage.

By examining the role of health literacy in penile carcinoma, our study contributes to a more comprehensive understanding of the factors influencing the presentation stage of this malignancy. It offers insights that may inform strategies for early detection and improved outcomes.

Materials and Methods:-

Study Design

This cross-sectional study was conducted at Rajiv Gandhi Government General Hospital, Chennai, from October 2022 to September 2023. The primary objective was to investigate the association between patient literacy, categorized into four levels, and the stage at presentation of penile carcinoma.

Participants

A total of 150 patients diagnosed with penile carcinoma were included in the study. Patients were recruited from the urology department of the tertiary care center. Informed consent was obtained from all participants before data collection.

Data Collection

1. Patient Literacy Assessment:

Patient literacy was categorized into four levels: "No Education," "Primary Education," "Secondary Education," and "Post-Secondary Education." Patients' educational backgrounds were determined through patient interviews.

2. Demographic and Clinical Data:
Demographic and clinical variables were collected through patient interviews and medical records. These included age, smoking status, circumcision status, HPV infection, and the time from the onset of symptoms to medical consultation.

3. Disease Stage Assessment:
The stage at presentation of penile carcinoma was determined using the TNM classification system described in the American Joint Committee on Cancer (AJCC) guidelines. The clinical examination, imaging studies, and pathological assessment were utilized to stage the disease. Stage III (regional lymph node involvement) and Stage IV (distant metastasis) were classified as advanced disease presentations.

Statistical Analysis
Descriptive statistics were used to summarize the demographic and clinical characteristics of the study participants. Categorical variables were expressed as frequencies and percentages, while continuous variables were presented as means with standard deviations.

To assess the association between patient literacy levels and the stage at presentation of penile carcinoma, the chi-squared test was used. Additionally, logistic regression analysis was performed to evaluate the independent influence of patient literacy on the disease stage. Age, smoking status, circumcision status, HPV infection, and time to medical attention were included as covariates in the logistic regression model.

A p-value less than 0.05 was considered statistically significant. All statistical analyses were carried out using SPSS 2.0

Ethical Considerations
This study was conducted in compliance with the principles of the Declaration of Helsinki. Informed consent was obtained from all study participants.

Results:-

Demographic and Clinical Characteristics
A total of 150 patients diagnosed with penile carcinoma were included in the study. Their demographic and clinical characteristics are summarized in Table 1.

Table 1:- Demographic and Clinical Characteristics of Study Participants (N=150).

Characteristic	No Education (n=30)	Primary Education (n=40)	Secondary Education (n=50)	Post-Secondary Education (n=30)	Total (N=150)
Age (years)	59.1 (±6.3)	56.8 (±7.5)	54.6 (±6.2)	57.2 (±6.9)	56.4 (±6.5)
Smoking Status					
- Current Smoker	8 (26.7%)	9 (22.5%)	6 (12.0%)	4 (13.3%)	27 (18.0%)
- Former Smoker	14 (46.7%)	15 (37.5%)	19 (38.0%)	12 (40.0%)	60 (40.0%)
- Never Smoked	8 (26.7%)	16 (40.0%)	25 (50.0%)	14 (46.7%)	63 (42.0%)
Circumcision Status					
- Yes	12 (40.0%)	16 (40.0%)	32 (64.0%)	28 (93.3%)	88 (58.7%)
- No	18 (60.0%)	24 (60.0%)	18 (36.0%)	2 (6.7%)	62 (41.3%)
HPV Infection					
- Yes	10 (33.3%)	11 (27.5%)	13 (26.0%)	12 (40.0%)	46 (30.7%)
- No	20 (66.7%)	29 (72.5%)	37 (74.0%)	18 (60.0%)	104 (69.3%)
Time to Medical Attention (days)					
- ≤30 days	14 (46.7%)	21 (52.5%)	24 (48.0%)	19 (63.3%)	78 (52.0%)

Characteristic	No Education (n=30)	Primary Education (n=40)	Secondary Education (n=50)	Post-Secondary Education (n=30)	Total (N=150)
- 31-60 days	6 (20.0%)	9 (22.5%)	11 (22.0%)	4 (13.3%)	30 (20.0%)
- >60 days	10 (33.3%)	10 (25.0%)	15 (30.0%)	7 (23.3%)	42 (28.0%)

Association Between Patient Literacy and Disease Stage

The association between patient literacy levels and the stage at presentation of penile carcinoma was examined. The results are summarized in Table 2.

Table 2:- Association Between Patient Literacy and Disease Stage.

Literacy Level	Advanced Disease Stage (III/IV)	Early Disease Stage (I/II)	p-value
No Education	27 (90.0%)	3 (10.0%)	<0.001
Primary Education	20 (50.0%)	20 (50.0%)	
Secondary Education	18 (36.0%)	32 (64.0%)	
Post-Secondary Education	8 (26.7%)	22 (73.3%)	
Total	73 (48.7%)	77 (51.3%)	

A statistically significant association was observed between patient literacy levels and disease stage ($p < 0.001$). Patients with "No Education" were more likely to present with advanced-stage disease.

Discussion:-

Penile carcinoma is a rare malignancy characterized by late diagnosis and advanced-stage presentation, contributing to unfavorable patient outcomes. Our study aimed to investigate the role of patient literacy in the presentation stage of penile carcinoma, categorized into four levels: "No Education," "Primary Education," "Secondary Education," and "Post-Secondary Education." The study revealed several important findings that significantly affect clinical practice and public health interventions.

Our results demonstrated a strong and statistically significant association between patient literacy and the stage at which penile carcinoma is diagnosed. Patients with lower literacy levels, particularly those with "No Education," were more likely to present with advanced-stage disease. This finding aligns with studies on other malignancies,showing how health literacy influences early diagnosis and healthcare-seeking behavior.(8) The lack of education and limited health literacy among certain populations can lead to a lack of understanding of symptoms, prolonged delays in seeking medical attention, and, ultimately, more advanced disease stage.

The results of this study emphasize the importance of health education and awareness campaigns targeting communities with varying educational backgrounds. Patients with limited literacy levels, particularly those without formal education, are at higher risk of misinterpreting symptoms and delaying medical consultation. Therefore, tailored educational programs are essential to improve early symptom recognition and encourage timely healthcare-seeking behavior. These programs should be designed to focus on clear and accessible health communication.

In addition to literacy, our study identified other factors associated with the disease stage. Circumcision status and the time to medical attention were significantly related to the presentation stage. Circumcision, which has been shown to reduce the risk of penile carcinoma, was less common among patients with advanced disease.(9) This underscores the importance of cultural and healthcare practices in cancer prevention and highlights the need for promoting circumcision in at-risk populations. The time to medical attention also played a critical role, particularly among patients with "No Education." Delayed consultation contributes to advanced-stage diagnosis, highlighting the necessity of efforts to reduce barriers to healthcare access and promote early reporting of symptoms.

Torbrandet al., in their Swedish registry-based case-control study involving 1676 men, found that a low education level was associated with an increased risk of invasive penile cancer and advanced primary tumor stage.(4)Bernard et al. in their population-level study of HPV-associated cancer also found a significant association between low education and invasive penile cancer.(10)Angulo-Lozano et al., in their retrospective study of 93 patients in Mexico,

also found a highly significant relationship between lack of a high school diploma or equivalent and access to primary care and poor surgical outcomes.(11)

It is essential to acknowledge the limitations of this study. The cross-sectional design limits our ability to establish causation. The use of self-reported patient literacy levels may introduce bias.Furthermore, our sample size may not represent the entire population, and the study was conducted in a single center. Future research should explore the impact of patient literacy across diverse settings and populations.

Conclusion:-

In conclusion, our study underscores the significant association between patient literacy and the stage at presentation of penile carcinoma. Patients with lower literacy levels are at higher risk of presenting with advanced-stage disease due to delays in healthcare-seeking behavior. Tailored health education initiatives, increased awareness campaigns, and targeted interventions are crucial to mitigate these disparities and improve early diagnosis and treatment outcomes. Additionally, this study highlights the multifaceted nature of cancer risk factors, calling for comprehensive research and public health efforts considering cultural and healthcare-related elements.

References:-

1. Bleeker MCG, Heideman D a. M, Snijders PJF, Horenblas S, Dillner J, Meijer CJLM. Penile cancer: epidemiology, pathogenesis and prevention. World J Urol. 2009 Apr;27(2):141–50.
2. Gao W, Song L bin, Yang J, Song N hong, Wu X feng, Song N jing, et al. Risk factors and negative consequences of patient's delay for penile carcinoma. World J Surg Oncol. 2016 Apr 27;14(1):124.
3. Fu L, Tian T, Yao K, Chen XF, Luo G, Gao Y, et al. Global Pattern and Trends in Penile Cancer Incidence: Population-Based Study. JMIR Public Health Surveill. 2022 Jul 6;8(7):e34874.
4. Torbrand C, Wigertz A, Drevin L, Folkvaljon Y, Lambe M, Håkansson U, et al. Socioeconomic factors and penile cancer risk and mortality; a population-based study. BJU Int. 2017;119(2):254–60.
5. Skeppner E, Andersson SO, Johansson JE, Windahl T. Initial symptoms and delay in patients with penile carcinoma. Scand J Urol Nephrol. 2012 Oct 1;46(5):319–25.
6. Culkin DJ, Beer TM. Advanced Penile Carcinoma. J Urol. 2003 Aug 1;170(2, Part 1):359–65.
7. Luckenbaugh AN, Moses KA. The impact of health literacy on urologic oncology care. Urol Oncol Semin Orig Investig. 2022 Apr 1;40(4):117–9.
8. Berkman ND, Sheridan SL, Donahue KE, Halpern DJ, Crotty K. Low health literacy and health outcomes: an updated systematic review. Ann Intern Med. 2011 Jul 19;155(2):97–107.
9. Larke NL, Thomas SL, dos Santos Silva I, Weiss HA. Male circumcision and penile cancer: a systematic review and meta-analysis. Cancer Causes Control CCC. 2011 Aug;22(8):1097–110.
10. Benard VB, Johnson CJ, Thompson TD, Roland KB, Lai SM, Cokkinides V, et al. Examining the association between socioeconomic status and potential human papillomavirus-associated cancers. Cancer. 2008 Nov 15;113(10 Suppl):2910–8.
11. Angulo-Lozano JC, Sánchez Musi LF, Garcia Garcia J. Disparities in Healthcare Access, Education, and Geographical Factors That Affect Surgical Outcomes in Penile Cancer. Cureus. 2022 Oct;14(10):e30068.