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Epidemiology and Clinical Challenges in Early Diagnosis of Penis Cancer in Developing Countries

I Gede Sukma Okta Perdana
Warmadewa University, Denpasar, Indonesia
Email: oktaperdanaaa@gmail.com

KEYWORDS

penile cancer, carcinoma, epidemiology, diagnostic penile cancer

ABSTRACT

Penile cancer, though rare globally, has a higher incidence in several developing countries due to factors such as human papillomavirus (HPV) infection, poor hygiene, and certain cultural practices. This study aimed to improve early detection and treatment of penile cancer in developing countries, reduce the burden of disease, and develop strategies for raising education and awareness in these regions. The research method used was descriptive with a qualitative approach. Data collection was carried out using documentation techniques, and analysis was conducted using triangulation. The research has significant implications for public health policy and medical education in developing countries. The findings emphasize the importance of creating culturally sensitive health campaigns and improving access to early diagnostic tools, which could ultimately lead to earlier detection and improved patient outcomes.

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Corresponding Author: I Gede Sukma Okta Perdana*
Email: oktaperdanaaa@gmail.com

INTRODUCTION

Cancer is one of the leading causes of death worldwide, with an estimated 10 million deaths recorded in 2019. Cancer is a group of diseases in which abnormal cells grow rapidly and can spread to surrounding tissues. It can appear in many parts of the body and, in some cases, can spread to other parts of the body via the blood and lymphatic systems. Although the world has made great strides in understanding and treating cancer, the global cancer death toll continues to rise, driven by population growth, aging, and greater progress in addressing other causes of death. Cancer is a deeply personal issue for many people, as almost everyone knows someone or has lost a loved one to the disease (Roser & Ritchie, 2024). Here are the cancer death rates in various countries around the world.

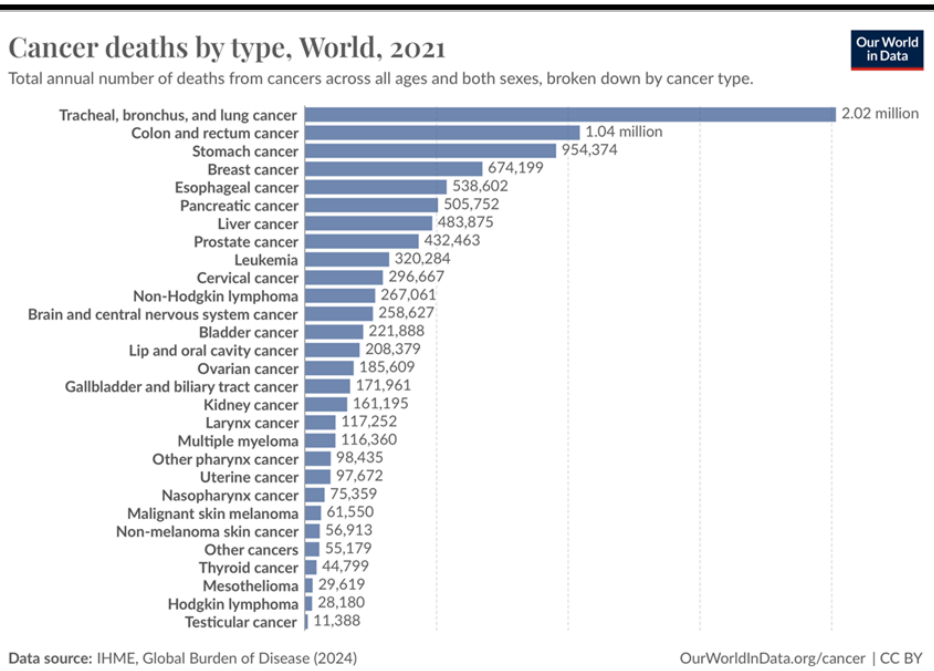

Figure 1. Number of Death Rates Due to Cancer
Data source: IHME, Global Burden of Disease (2024)

Cancer has various types, and one type that has a high incidence is breast cancer. As the data below.

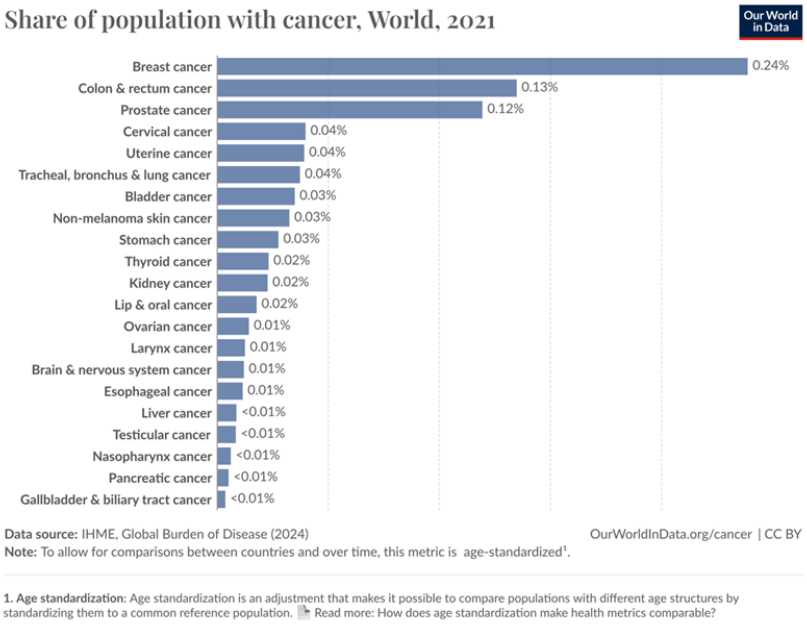

Figure 2. Population of Cancer Sufferers in the World
Data source: IHME, Global Burden of Disease (2024)

One type of cancer that has a low incidence is penile cancer. Data from Globocan in 2021 stated that the number of penile cancer cases in Indonesia from 2015 to 2020 was recorded at 2,954 cases. This figure is relatively low when compared to lung cancer, which recorded 37,663 cases. However, penile cancer remains a serious disease that needs to be watched out for.

Penile cancer is a relatively rare cancer, with prevalence varying by geographic location. In developed countries, the incidence of penile cancer is relatively low due to better access to health services and effective screening programs. However, in developing countries, penile cancer is more common, often due to limitations in medical access, lack of awareness, and cultural or social factors that may hinder early detection and treatment (Dharma et al., 2021).

Borque-Fernando et al., (2023) study stated that the diagnosis and treatment of penile cancer are often suboptimal due to several factors, including lack of knowledge, limited medical facilities, and delays in detection. To overcome these problems and improve treatment outcomes, identifying referral centers that specifically handle penile cancer is essential.

Research on the epidemiology and clinical challenges in early diagnosis of penile cancer in developing countries offers significant novelty as it has not been widely conducted in this region. The main focus of this study is to identify the prevalence and distribution of penile cancer, and to analyze the specific challenges faced in early diagnosis, such as limited medical facilities, lack of training of medical personnel, and social and cultural factors affecting awareness and access to care. By collecting comprehensive epidemiological data and proposing relevant intervention programs and health policies, this study aims to improve early detection and treatment of penile cancer in developing countries, reduce the burden of the disease, and develop strategies for education and awareness-raising in developing countries.

The benefits of this research are manifold. It will not only contribute to enhancing the capacity of healthcare systems to detect penile cancer early but also inform the creation of culturally appropriate education campaigns. Moreover, it will provide crucial data for policy-makers to allocate resources more effectively, ultimately leading to improved survival rates and a reduction in health disparities associated with penile cancer in developing countries.

METHOD

This study uses a descriptive method with a qualitative approach. The descriptive method allows researchers to provide a detailed description of the phenomenon being studied (Adiwisastra et al., 2020). Meanwhile, a qualitative approach is a research method that focuses on an in-depth understanding of social phenomena or human behavior through non-numerical data analysis. This approach aims to explore the subjective perspectives and experiences of individuals or groups in a particular context (Prayogi, 2021).

The data collection technique used is documentation, which is a method that involves analyzing existing written documents, such as official reports, historical archives, medical records, correspondence, and policy documents, to obtain information relevant to the research (Jailani, 2023). Data analysis uses triangulation, which means an analysis that involves the use of several sources, techniques, or theories to validate research findings and ensure the accuracy and credibility of the data. Triangulation aims to provide a more comprehensive picture and reduce bias in research by combining various perspectives and approaches (Alfansyur & Mariyani, 2020).

RESULT AND DISCUSSION

Cancer is a medical condition in which abnormal cells in the body grow and multiply uncontrollably, forming a mass or lump called a tumor (Wang et al., 2018). Symptoms of cancer vary depending on the type and location of the cancer, but can include weight loss, fatigue, pain, or an unusual lump. Diagnosis usually involves medical tests such as a biopsy, scans, or laboratory tests. Cancer treatment often requires a multidisciplinary approach involving multiple specialists. Cancer can

occur in almost any part of the body and has many different types, depending on the type of cells involved and the location of the tumor (Dolgin, 2021). One of the cancers that can occur is penile cancer.

Penile cancer is a type of cancer that occurs in the tissue of the penis, usually starting from skin cells or mucosal tissue in the area. This cancer often develops slowly and can appear in various forms, such as non-healing wounds, lumps, or changes in skin color on the penis (Trianto & Rahaju, 2021). The causes of penile cancer are related to several risk factors that can increase a person's chances of developing this disease. The cause of penile cancer is often related to smegma, a cheesy-smelling substance that accumulates under the skin of the glans penis. Usually, penile cancer starts from a small lesion on the head of the penis, accompanied by symptoms such as swelling, lesions, changes in the color of the skin of the penis, and pain that can be felt in the area (Nurbaiti & Rahmantika Puji Safitri, 2023).

One of the main factors is infection with Human Papillomavirus (HPV), especially types 16 and 18, which can cause changes in the cells of the penis. Poor hygiene is also an important factor, as the buildup of smegma (oil and dead skin cells) under the foreskin can cause chronic irritation and increase the risk of cancer. In addition, uncircumcised men are more susceptible to penile cancer due to the lower risk of infection and poor hygiene (Gultom, 2021). Other factors include smoking, which can damage cell DNA and weaken the immune system, as well as medical conditions such as phimosis (an unretractable foreskin) and chronic inflammatory diseases of the penis. Exposure to carcinogenic substances, a weakened immune system, and advancing age can also increase the risk of penile cancer (Amelia et al., 2023).

Early diagnosis of penile cancer is very important because it can significantly increase the chances of recovery. In the early stages, penile cancer tends to be easier to treat, often with less invasive methods such as local surgery or laser therapy, reducing the risk of complications and the need for more aggressive measures such as amputation (Hatta & Hutapea, 2024). Early diagnosis can also prevent the spread of cancer to the lymph nodes or other organs, which if it does, will make treatment more difficult and reduce the prognosis. In addition, early detection helps improve the patient's quality of life due to the higher chance of cure and fewer side effects of treatment (Albersen & Spiess, 2019). Although penile cancer is relatively rare globally, some countries report quite high incidence rates as shown in the figure below.

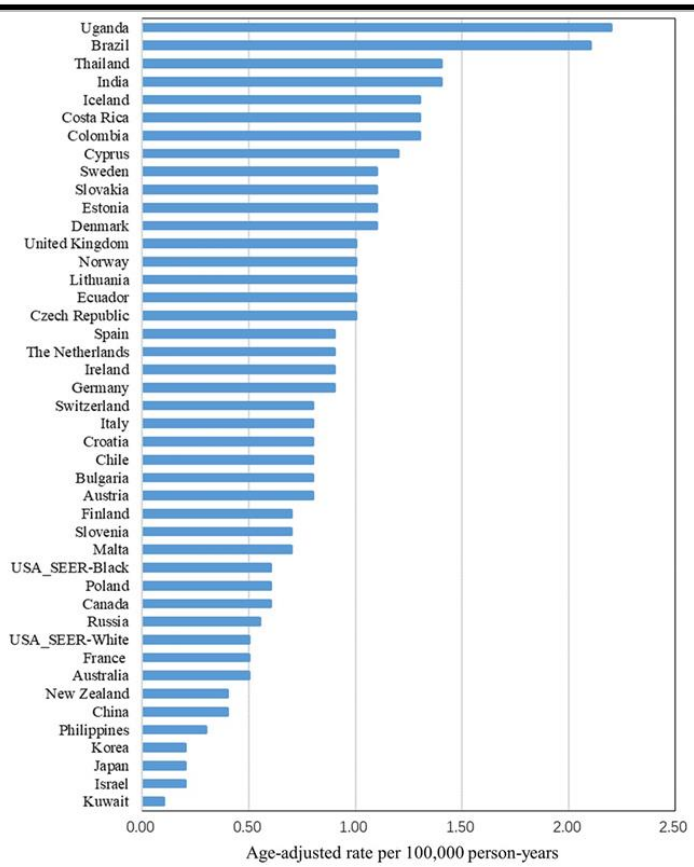

Figure 3. Age-adjusted penile incidence rates (world standard population), 2008-2012.

Based on Figure 3, which shows the incidence of penile cancer adjusted for age (world standard population) for the period 2008-2012, it can be seen that several developing countries experienced higher incidence rates compared to developed countries. Diagnosing penile cancer in developing countries is a complex and multidimensional challenge. One of the main obstacles is the limited health infrastructure, where medical facilities equipped with sophisticated diagnostic tools are not always available, especially in rural or remote areas (Kamolratanakul & Pitisuttithum, 2021). Hospitals that have oncology specialists or tools such as biopsies, endoscopy, and other supporting tests are often concentrated in large cities, making access for those living outside urban areas very limited, causing many cases of penile cancer to go undetected until an advanced stage (Thomas et al., 2021).

In addition, low health literacy and lack of public awareness of early symptoms of penile cancer exacerbate the problem. Symptoms such as non-healing sores, lumps, or changes in skin color on the penis are often ignored or considered minor health problems that do not need to be checked. Lack of public education about cancer and the importance of early detection prevents men from seeking medical care promptly, allowing cancer to progress unnoticed. In some cases, social stigma and taboos around sexual health issues discourage men from discussing their symptoms or visiting a doctor, especially in conservative settings (Vanthoor et al., 2021).

Economic factors also play a major role in this challenge. Many individuals in developing countries cannot afford regular health check-ups or undergo the diagnostic tests needed to detect cancer (Sari et al., 2024). Limited or non-existent health insurance systems, as well as the high cost of medical care, add to the burden on society, causing many sufferers to delay or even avoid medical examinations.

As a result, cancer is often diagnosed at an advanced stage, when treatment options are fewer, more expensive, and have a worse prognosis (Arini et al., 2023).

Medical personnel trained in the diagnosis and treatment of penile cancer are also limited in many developing countries. The shortage of specialist doctors, especially oncologists or urologists, reduces the ability to make accurate and rapid diagnoses. In addition, the lack of specific training in penile cancer and other rare cancers makes many health workers less skilled in identifying early symptoms of the disease (Welan, 2023). Misdiagnosis or delays are more common, which delays appropriate treatment.

This challenge is compounded by the lack of health policies that support early detection and comprehensive treatment of cancer. Cancer screening programs in developing countries often focus on more common cancers such as cervical, breast, or lung cancer, while relatively rare penile cancer is often overlooked. As a result, treating penile cancer is a low priority, both in terms of resource allocation and government attention.

Thus, the epidemiology of penile cancer in developing countries shows a higher prevalence compared to developed countries, often due to factors such as Human Papillomavirus (HPV) infection, poor hygiene, and lack of access to health services. Clinical challenges in early diagnosis of penile cancer include lack of awareness and education about early symptoms, limited adequate medical facilities, and social stigma that may prevent patients from seeking care. Effective management requires a comprehensive approach that includes improving health education, educating about the importance of regular check-ups, and strengthening health systems to provide better access and care.

CONCLUSION

Penile cancer has a higher incidence in some developing countries, as seen in age-adjusted data for the period 2008-2012. The disease usually begins as a small lesion on the head of the penis and can be caused by factors such as Human Papillomavirus (HPV) infection, poor hygiene, and certain cultural practices. Challenges in early diagnosis in developing countries include limited medical infrastructure, low public awareness, social stigma, and economic constraints that hinder access to health services. In addition, the shortage of trained medical personnel and health policies that do not support early detection further exacerbate the situation, so that many cases of penile cancer are not diagnosed until later stages, when treatment becomes more complex and expensive. Future research should focus on developing culturally sensitive awareness programs, improving early detection strategies, and investigating innovative low-cost diagnostic tools that could be implemented in resource-limited settings to improve outcomes for penile cancer patients.

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