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On the occasion of world cancer day 2025; predisposing factors of cancer in glomerulopathies

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Abstract
Patients with glomerulopathies are at an elevated risk for developing cancers due to a complex interplay of intrinsic immune dysfunction, age-related factors, comorbidities, and the effects of immunosuppressive therapies. Regular screening for malignancies is recommended, especially in high-risk groups such as those with membranous nephropathy or older patients, to facilitate early detection and improve outcomes.

Keywords: Cancer, World cancer day, Glomerular disease, Membranous nephropathy
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Introduction

World cancer day is observed annually on February 4, with the next occasion in 2025 set for that date (1). This international day aims to raise awareness about cancer, promote its prevention, detection, and treatment, and encourage action against the global cancer epidemic (2). This event is spearheaded by the union for international cancer control (UICC) and supports the goals outlined in the world cancer declaration (3). Every three years, world cancer day and UICC introduce a new campaign theme along with specific focuses for each year (4). The overarching theme for the 2022-2025 campaign is "closing the care gap", which aims to tackle disparities in access to cancer care among various populations. Specifically, the theme for world cancer day in 2025 is "uniting our voices and taking action" (5). This ceremony emphasizes the need for collective efforts to address inequities in cancer treatment and support systems globally (5). The world cancer day features numerous events globally, including awareness campaigns, fundraising initiatives, and community gatherings aimed at reducing stigma and misinformation surrounding cancer (6). The significance of this day lies in its ability to unite individuals, organizations, and governments in a collective effort to combat cancer and improve patient outcomes worldwide (7).

Glomerular disease associated with malignancies, is relatively rare. This condition presents with significant clinical challenges and are characterized by unique features (8). These diseases can arise from both solid tumors and hematologic malignancies, each exhibiting distinct pathophysiological mechanisms (8,9). Correspondingly, the association between glomerulopathies and development of cancer highlights the importance of monitoring for malignancies in affected patients, especially those undergoing immunosuppressive therapy or presenting with specific types of glomerular disease like membranous nephropathy (8-10). In this mini-review, we sought to discuss about predisposing factors of cancer in glomerulopathies as an under-noticed subject in clinical nephrology across with world cancer day.

Search strategy

For this review, we searched PubMed, Web of Science, EBSCO, Scopus, Google Scholar, Directory of Open Access Journals (DOAJ) and Embase, using different keywords like cancer, world cancer day, glomerular disease, membranous nephropathy.

The concept of "close the care gap"

The theme "close the care gap" has brought attention to the disparities in cancer care access, particularly for marginalized populations (11). This concept emphasizes that, factors such as socioeconomic status, geography, and cultural contexts can greatly affect an individual's ability to receive timely and effective cancer treatment (12). In addition, some organizations have leveraged this theme to strengthen patient advocacy groups, enabling them to raise awareness and demand better care within their communities (13). Furthermore, this campaign encourages individuals and organizations to unite in their efforts to address these gaps. This effort has led to

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Implication for health policy/practice/research/ medical education

Understanding the relationship between glomerular diseases and malignancies is crucial for timely diagnosis and management. The diverse pathophysiological mechanisms underscore the need for careful evaluation in patients presenting with renal symptoms alongside a known or suspected malignancy. Early identification and treatment can lead to improved outcomes for affected individuals.

various initiatives, such as community outreach programs and educational campaigns aimed at improving cancer literacy among underserved populations (14). Meanwhile, health institutions are adopting innovative approaches to bridge care gaps. For example, mobile screening units are being introduced in rural areas to enhance access to mammography services, directly addressing geographical barriers (15). Therefore, the idea of "close the care gap" has not only raised awareness about cancer disparities but has also mobilized communities and health systems towards actionable solutions, aiming for a more equitable future in cancer care (16).

Cancer in glomerular disease

Cancer risk in patients with glomerulopathies is influenced by a combination of intrinsic and extrinsic factors (17). Patients with glomerular disease often exhibit intrinsic immune dysfunction, which may predispose them to malignancies. This dysfunction can lead to altered immune responses that facilitate tumor development and progression (17). For instance, older age is a significant risk factor for cancer in patients with glomerular diseases, particularly in those over 60 years old (18). The prevalence of malignancies is notably higher in conditions like membranous nephropathy and IgA nephropathy (19). Additionally, higher comorbidity rates, including chronic conditions such as hypertension and diabetes, are associated with increased cancer risk in these patients (18-20). Likewise, certain types of glomerulopathies, particularly membranous nephropathy, are more frequently associated with malignancies (8). Studies indicate that up to 10% of patients with membranous nephropathy may have an underlying cancer (21). Since, extrinsic factors are consisted of the administration of immunosuppressive agents, which is often necessary for managing glomerular disease, significantly increases the risk of developing de novo cancers (17). This risk is attributed to both direct mutagenesis and the disruption of immune surveillance mechanisms (17). Moreover, factors such as smoking (especially heavy smoking) and exposure to carcinogenic substances can elevate cancer risk in these patients (22). Finally, some viral infections such as hepatitis B (HBV), hepatitis C (HCV), Epstein-Barr virus (EBV), and human papillomavirus (HPV) have been implicated in the development of cancers among individuals with glomerular diseases (23).

Mechanisms of cancer development in glomerulopathies

The presence of autoantibodies against tumor antigens may lead to immune complex deposition in the kidneys, exacerbating glomerular damage and potentially facilitating tumor growth (24). Besides, conditions like minimal change disease have shown overexpression of cytokines such as interleukin-13 (IL-13), which may play a role in both glomerular injury and malignancy development (25). The pathogenesis of glomerular diseases related to malignancies often involves immune-mediated mechanisms (24). In solid tumors, circulating tumor antigens may form immune complexes that deposit in the kidneys, leading to inflammation and damage (10). Accordingly, tumor-derived cytokines may promote inflammatory processes affecting kidney function (26). Meanwhile, cancer may lead to intrinsic immune dysfunction, increasing susceptibility to glomerular diseases (17).

A short look at the most common cancers associated with glomerulopathies

The most common cancers associated with glomerulopathy, particularly in patients with conditions like membranous nephropathy, include hepatocellular carcinoma. This type of liver cancer is frequently observed, with studies reporting it in approximately 13.3% of cases involving glomerulopathy (17,27). Next cancer is colon carcinoma, which has been found in about 11.1% of patients, colon cancer is another prevalent malignancy linked to glomerular diseases (17). Meanwhile, papillary thyroid carcinoma accounts for around 8.9% of malignancies seen in patients with glomerulopathy (17). Furthermore, gastric carcinoma is presented in about 6.7% of cases, gastric cancer is also noted among the malignancies associated with these kidney conditions (17). Similarly, prostate cancer is reported in approximately 6.7% of patients, while, lymphoma is also detected in about 6.7% of cases (17). Additional malignancies include lung cancer and breast cancer, which are frequently observed in patients with solid tumors related to glomerular diseases (10).

Conclusion

Recognizing the associations between cancers and glomerular disease is crucial for timely diagnosis and management. Additionally, patients with glomerular diseases should be screened for underlying malignancies, especially if they present with nephrotic syndrome or other renal abnormalities. Early detection of cancer can significantly impact treatment outcomes and overall prognosis.

Conflicts of interest

The author declares that she has no competing interests.

Ethical issues

Ethical issues (including plagiarism, data fabrication, double publication) have been completely observed by the author.

Declaration of generative AI and AI-assisted technologies in the writing process

During the preparation of this work, the authors utilized Perplexity to refine grammar points and language style in writing. Subsequently, the authors thoroughly reviewed and edited the content as necessary, assuming full responsibility for the publication's content.

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