Short Communication
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Cancer in Iraq, General View of Annual Report 2022

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Abstract
Objective: Increasing cancer rate in Iraq is a concerning issue. The rise in life expectancy, shift in behavior risk factors, and the effects of armed conflict may be contributing to this increase. This work was carried out to provide a review of cancer in Iraq.
Methods: Data were obtained from cancer registration, cancer board in Iraq in Ministry of Health in Iraq for the years 1976 to 2022. Cancer incidence was calculated as case per 100000 population for each year. Population of Iraq was obtained from Ministry of Planning.
Results: Incidence of cancer has generally increase through the time (upward trendline in incidence of cancer over years). The R^2 suggests a reasonable capture in variation in the incidence of cancer. The age -standardized incidence rate of cancer in 2022 was 158.94 per 100000. Incidence rates were more prominent in Al-Najaf, Al-Sulaymaniyah, Erbil and Karbala (123.74, 121.4, 119.9 and 111.8 per 100 000, respectively).
Conclusion: Addressing the issue of cancer in Iraq requires a multifaceted approach that includes improving environmental conditions, enhancing healthcare services and raising awareness about cancer prevention and early detection.
Keywords: Iraq, cancer, age standardized incidence rate, shift in behavior risk factor

Introduction

The increase in cancer rates in Iraq has been a concerning issue in recent years.[1] The burden of cancer is increasing in low- and middle-income countries (LMICs),[2] where about two-thirds of all cancer deaths occur. This might be explained by increasing life expectancy coupled with changing patterns of behavioral risk factors associated with higher non-communicable disease risk, such as tobacco and alcohol use, obesity, physical inactivity and an unhealthy diet. Longer-term impacts of armed conflict on cancer incidence may also be a result of the toxic contamination of the environment and stress experienced during armed conflicts that encourage unhealthy behaviors and increase the risk of cancer, such as tobacco and alcohol use.[3,4] Finally, mass population displacement increases the risk of communicable disease transmission, which in turn increase the infectious causes of cancer, such as human papillomavirus and chlamydia trachomatis (cervical cancer), Epstein–Barr virus (nasopharyngeal cancer and lymphomas), hepatitis B and C (liver cancer, non-Hodgkin lymphoma) and others.

Publication reviews of cancer in Iraq are scarce. Therefore, this work with done to provide a review of cancer in Iraq.

Materials and Methods

Data were obtained from cancer registration, cancer board in Iraq in Ministry of Health in Iraq for the years 1976 to 2022. Cancer incidence was calculated as case per 100000 population for each year. Population of Iraq was obtained from Ministry of Planning. Distribution of cases was done and a regression line.

Results

Incidence of cancer has generally increase through the time (upward trendline in incidence of cancer over years). The R^2 suggests a reasonable capture in variation in the incidence of cancer (Fig. 1).

Discussion

A clear increase in the incidence of cancer was observed. There are several factors that contribute to this rise, including environmental pollution from past conflicts, such as the Gulf Wars in Iraq,[5] as well as the use of depleted uranium in military operations.[6] Additionally, inadequate healthcare infrastructure and limited access to cancer treatment and prevention services have also played a role in the escalating cancer rates.[7]

The obvious increase in crude incidence rate is in the line of increase incidence (crude and/or age-specific rate) of cancer globally in the last century.[7] The increasing trend was influenced by various factors, e.g., lifestyle changes, environmental factors, and improved detection methods.

Over the last two decades, Iraq has experienced significant changes in various aspects of its lifestyle. The country has seen improvements in life expectancy and economic development. Iraq's life expectancy has increased to 71.2 years,[8] and its GDP per capita has risen from $855 in 2003 to $ 5979 in 2024.[9] These indicate an improvement in living standards and economic conditions over the years. Increased prevalence of obesity, smoking, and low physical activity are well known risk factors for cancer.

Wars can have several effects on the incidence of cancer through environmental impact, disrupt health care

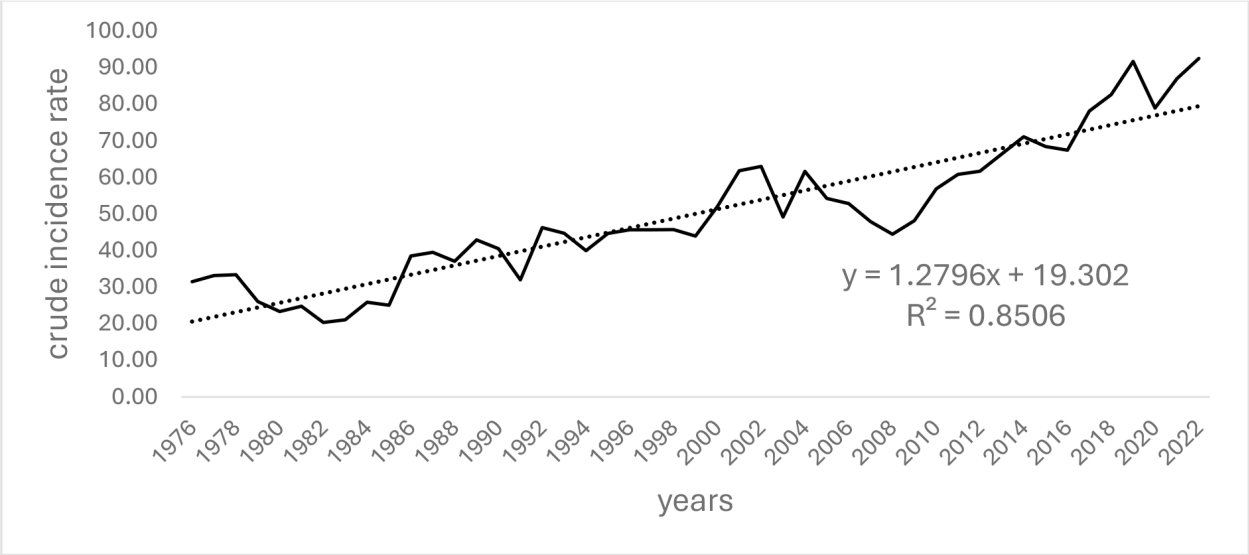

Fig. 1 **Incidence distribution of cancer cases in Iraq through 1976–2022.**

services, psychological stress and trauma and exposure to chemical weapons.[10]

Disrupt health care services might be attributed to neglect preventive measures and dominating the curative services of health system.

Exposure to chemical weapons can potentially affect the incidence of cancer even after 5 decades. Some chemical agents have long term effects on health including an increase of incidence of cancer due to genetic damage and other mechanisms.[11]

The use of chemical weapons in Iraq's wars has been a significant and controversial aspect of its military history. During the Iran-Iraq War (1980–1988), Iraq engaged in chemical warfare against Iran on multiple occasions, including more than 30 targeted attacks.

The observed age -standardized incidence rate (ASIR) of cancer in 2022 was 158.94 per 100000. It is lower than that estimated global age-standardized cancer rate 790.3 cases per 100,000 people.[12] This means that the cancer rate in Iraq is lower than the global average. Cancer rates can vary widely by region and country due to factors such as lifestyle, environmental conditions, access to healthcare, and genetic predisposition.

Overall, while the age-standardized cancer rate in Iraq is lower than the global average, it's essential to continue monitoring and addressing the factors that contribute to cancer incidence in the country to ensure that effective prevention, early detection, and treatment measures are in place.

The ASIR is lower than that reported in Egypt (166.6 per 100000)[13] and much higher than that reported in Saudi Arabia (96.4 per 100000).

Incidence rates were more prominent in Al-Najaf, Al-Sulaymaniyah, Erbil and Karbala (123.74, 121.4, 119.9 and 111.8 per 100 000, respectively). This finding might be explained by exposure of mentioned governorates to brutally suppression of rebellions 3 decades ago i.e., war (bombing and chemical exposure). Social strife and sectarian violence might be other factors in this phenomenon.

Conclusion

It's important to note that addressing the issue of cancer in Iraq requires a multifaceted approach that includes improving environmental conditions, enhancing healthcare services, and raising awareness about cancer prevention and early detection. Efforts to address these factors can help mitigate the impact of cancer in Iraq and improve the overall health and well-being of the population.

Conflict of Interest

None.

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