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Retrospective Analysis of Uterine Malignancy and Ovarian Carcinoma Trends in Tabuk, Saudi Arabia

Saeed Albalawi[1*]

[1]Department of Obstetrics and Gynecology, Faculty of Medicine, University of Tabuk, Tabuk, Saudi Arabia.

***E-mail** ✉ Saeed.albalawi@ut.edu.sa

Abstract

Access to accurate data concerning gynecological malignancies plays a critical role in effective health planning and policymaking. To date, no study has specifically examined the burden of gynecological cancer within the region of Tabuk, Saudi Arabia. This study sought to address that gap by evaluating its prevalence. A retrospective analysis was conducted at King Fahd Specialists Hospital, one of the four randomly selected main healthcare institutions in Tabuk City, Kingdom of Saudi Arabia. The study was conducted from November 2023 to February 2024 and involved reviewing records of adult female patients diagnosed with malignancies between 2019 and 2021. Data collected included patient age, cancer classification, diagnostic technique, and tumor laterality, using a structured data sheet. Statistical analysis was performed using the Statistical Package for Social Sciences (SPSS) version 27 (IBM). Among the 544 documented malignancy cases, the leading types of cancer in Tabuk were breast (18.2%), colon (12.7%), and thyroid (12.1%). Gynecological malignancies were the seventh most frequent overall. Uterine malignancy accounted for 1.7% of the cases, while ovarian carcinoma represented 1.5%. All tumors identified were malignant, with adenocarcinoma comprising 45% of these. The diagnosis was confirmed through histopathological evaluation in 52.6% of patients, cytological analysis in 36.8%, and surgical intervention in 10.6%. Bilateral tumor involvement was observed in 84.2% of cases, whereas 10.6% affected the right ovary or uterus and 5.2% were left-sided. In summary, gynecological malignancies ranked sixth in frequency among all reported cancers in Tabuk City. Uterine malignancy emerged as the most prevalent type, closely followed by ovarian carcinoma. Adenocarcinoma was the dominant histological form, and diagnosis was most often made by histology and cytology, with surgery as a secondary method. This study emphasizes the need for broader, multi-institutional research to better understand the trends in gynecological malignancy and the factors influencing their development in this region.

Keywords: Saudi Arabia, Ovarian carcinoma, Uterine malignancy, Tabuk

Introduction

Cancer remains a major public health issue worldwide, with an estimated 19.3 million new diagnoses reported globally in 2020. Gynecological malignancies alone constituted around 19% of all cancer cases during that year [1]. According to the International Agency for Research on Cancer, nearly one million new instances of gynecological cancer were recorded in 2020 [2]. Within the Kingdom of Saudi Arabia, the same report cited approximately 13,000 new cancer cases among women; however, dedicated investigations into gynecological malignancies remain sparse in the region [3]. Existing research is often constrained by limitations such as short observation periods and small sample sizes. Among Saudi women, gynecological cancers represent the fourth most commonly diagnosed group of malignancies, trailing behind breast, thyroid, and colorectal cancers. Incidence rates appear to vary significantly across different regions, influenced by environmental exposures, genetic predisposition, and geographic disparities [4].

With cancer incidence climbing nationally, a shift in the distribution of various cancer types has also been noted. This underscores the urgent need for detailed and easily

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accessible data, which is critical for informing national health strategies and the effective distribution of healthcare resources [5]. Moreover, understanding the sociodemographic characteristics and risk profiles of affected individuals could guide clinical decision-making and support the implementation of targeted preventive efforts—such as smoking cessation programs and lifestyle interventions [6]. Given Saudi Arabia's vast landmass (exceeding 2 million square kilometers) and substantial regional variation [7], it becomes particularly important to investigate cancer patterns on a more localized scale.

Despite improvements in healthcare access and outcomes and a general decline in cancer-related mortality across Saudi Arabia between 1990 and 2017, the overall years lived with disability due to chronic diseases, including neoplasms, have continued to increase [8]. On a global level, ovarian carcinoma ranks eighth among the most common cancers in females and remains a leading cause of cancer-related death in Saudi Arabia. Nationally, it is the seventh most frequent malignancy in women, and its prevalence has grown notably—rising nearly fourfold by 2018 [1, 9].

Endometrial carcinoma holds the position of the sixth most common cancer among women and is recognized as the second most frequently occurring malignancy of the female reproductive tract [10, 11]. Despite these rising figures, no previous studies have specifically examined the incidence and pattern of gynecological cancer in Tabuk City, Saudi Arabia. Therefore, this research aims to fill that gap by focusing specifically on ovarian carcinoma and uterine malignancy within this region.

Materials and Methods

Study design and location

This study was designed as a retrospective review conducted at King Fahd Specialist Hospital, situated in Tabuk City, Saudi Arabia, from November 2023 to February 2024. The hospital was selected randomly from the 4 central hospitals in the city.

Study duration and data collection

The study analyzed the medical records of cancer patients at King Fahd Specialist Hospital who were diagnosed between 2019 and 2021. A custom data sheet was used to collect key information, including patients' ages, cancer types, diagnostic methods, malignancy potential, and tumor laterality (whether the cancer was unilateral or bilateral). King Fahd Specialist Hospital serves the entire Tabuk Region and acts as a referral center for other local healthcare facilities. Tabuk City, located in the northwest of Saudi Arabia, has a population of 667,000 as per 2021 data. The Oncology and Pathology Departments at the hospital maintain accurate and organized records, which were complemented by information from multidisciplinary tumor board meetings.

Inclusion and exclusion criteria

The study specifically focused on adult women diagnosed with gynecological cancers, such as ovarian, uterine, cervical, and vaginal cancers. Pediatric cancer cases were excluded from this analysis.

Ethical considerations

Patient confidentiality was strictly maintained following the Helsinki Declaration. Personal identifiers such as names or file numbers were excluded from the study. All data were securely stored in an encrypted file. The research was approved by the Ethics Committee of the University of Tabuk (approval number UT-282-125-2023).

Data analysis

Data were processed and analyzed using Statistical Package for Social Sciences (SPSS) version 27 (IBM). Results are presented as means ± standard deviation (S.D.) and percentages, as shown in **Table 1**.

Results and Discussion

In this study, a total of 544 cancer patient records were reviewed, with ages ranging from 37 to 92 years (mean ± S.D., 60.7 ± 16.6). The most frequently diagnosed cancers in Tabuk City included breast (18.2%), colon (12.7%), and thyroid (12.1%) cancers, whereas gynecological malignancies represented 3.5% of all cancer cases, placing them sixth overall when lymph node cancers were excluded **(Table 1)**.

Uterine and ovarian cancers accounted for 1.7% and 1.5% of cases, respectively, with all being malignant. The majority of these tumors were classified as in situ (68.4%), with 42.1% being adenocarcinomas. Histology was the primary diagnostic method for 52.6% of cases, while 36.8% were diagnosed through cytology. Granulosa cell tumors were identified post-surgery. Most of the gynecological malignancies were bilateral

(84.2%), with 10.6% affecting the right side and 5.2% on the left **(Tables 1 and 2)**.

Table 1. The different shades of cancer in King Fahd Specialists Hospital in Tabuk City during the period 2019-2021

Type of cancer	N (%)
Breast	99 (18.2%)
Lymph nodes	70 (12.8%)
Colon	69 (12.7%)
Differentiated thyroid carcinoma	66 (12.1%)
Carcinoma of the lung	29 (05.3%)
Bone marrow	26 (04.8%)
Gynecological malignancies	19 (03.5%)
Liver malignancies	18 (03.3%)
Urinary bladder	17 (03.1%)
Stomach	16 (18.2%)
Nasopharynx	16 (18.2%)

Table 2. The pattern of ovarian and uterine malignancies in King Fahd Specialists Hospital, Tabuk City, Saud Arabia (total number = 354)

Character	No%
Ovarian tumor	8 (1.5% in all cancers and 42.1% of gynecological)
Uterine tumor	9 (1.7% in all cancers and 47.4% of gynecological)
Both ovary and uterus (granulosa cell tumor)	2 (0.4%)
Vaginal malignancy	2 (0.4%)
Endocervix	1 (0.2)
Adenocarcinoma	8 (42.1%)
Laterality	
Paired	16 (84.2%)
Left	1 (5.2%)
Right	2 (10.6%)
Method of diagnosis	
Cytology	7/ (36.8%)
Histology	10 (52.6%)
Surgery	2 (10.6%)
Age years (mean± S.D.)	69.7±16.6

In this investigation, 544 cancer patient records were examined, with ovarian and uterine cancer rates recorded at 1.7% and 1.5%, respectively. These figures are notably lower compared to those reported by Alhamadh *et al.* [12], who found ovarian cancer in 7.5% and uterine cancer in 9.3% of cancer cases in Riyadh, Saudi Arabia, based on 321 cancer records. It is important to note that Alhamadh *et al.* [12] focused solely on solid tumors. The cancer distribution in Tabuk City varied somewhat from Alhamadh *et al.*'s study [12], with breast, colon, and thyroid cancers as the most common, while gynecological cancers ranked sixth in frequency. This study's data show that gynecological malignancies in Tabuk City make up a significant proportion of cancer diagnoses.

Almohammadi *et al.* [13], in their research in the Al-Madinah Al-Munawarah region of Saudi Arabia, reported that 13.5% of gynecological cancers were ovarian, and 69% were uterine, which aligns with the present study where uterine cancer was slightly more common (47.4% versus 42.1%). Uterine cancer prevalence has been consistently found to be higher than ovarian cancer in various studies, including those from the United States [14], which supports our results. The discrepancies in cancer rates between this and other studies can be explained by differences in inclusion criteria, sociodemographic characteristics, and regional cancer burden.

The incidence of ovarian and uterine cancers in this study is concerning when compared to European data, where uterine cancers are the fourth most common cancer in women, with an incidence rate between 12.9 and 20.2 per 100,000 [15]. In North America and Europe, an increase in uterine cancer mortality has been attributed to rising obesity rates, genetic factors, and changing sociodemographic factors [15]. In 2020, there were an estimated 1.3 million cases of gynecological cancer worldwide, with around 50% of patients succumbing to the disease, underscoring the significant threat these cancers pose to women's health [16]. Endometrial cancer rates are high in regions like the USA, Europe, and Australia but lower in South and Central Asia, reflecting differences in risk factors such as obesity, diabetes, and hormone exposure [1, 17].

An increasing trend in gynecological cancer cases has been reported in parts of Asia and Europe [18, 19]. Although ovarian cancer is rare in women under 40, the highest incidence occurs in women aged 50 to 70 years. It remains the deadliest gynecological cancer, with 207,252 deaths recorded from 313,959 cases globally in 2020 [20]. Ovarian cancer's late-stage diagnosis, often

due to vague symptoms that mimic gastrointestinal or urinary problems, means that many women are diagnosed at advanced stages (III and IV), leading to poorer outcomes [21]. Therefore, the need for improved screening and targeted prevention strategies, particularly for modifiable risk factors such as family history, obesity, smoking, lack of exercise, hormone therapy, and vitamin D deficiency, is critical in tackling ovarian cancer [22]. Additionally, mutations in the BRCA genes and MMR deficiency significantly elevate the risk of ovarian cancer by 10% to 40% [23]. Given the high prevalence of vitamin D deficiency among Saudi females (69.6%–80.1%) [24] and the increasing rate of smoking among males (32.5%) and females (3.9%) [25], women in Saudi Arabia might be at a heightened risk due to these factors. Measures like smoking cessation, vitamin D supplementation, and increased sun exposure are essential for reducing risks.

In this study, a granulosa cell tumor and a case of vaginal cancer were also observed, consistent with other studies [26, 27]. The majority of tumors in this research were diagnosed as malignant and in situ, which is similar to the findings of Almohammadi *et al.* [13], who reported that 84.1% of their cases were categorized as grade I or II.

The primary strength of this study lies in its pioneering nature in Tabuk City, providing initial data that will serve as a foundation for future research and help inform healthcare policy for better planning and resource allocation.

Study limitations

This research is limited by its retrospective design, a relatively small sample size, and the fact that it was conducted in only one tertiary hospital.

Conclusion

Ovarian cancer was the most commonly diagnosed malignancy in Tabuk City, followed closely by uterine cancer, with adenocarcinoma being the most prevalent histological type in both. Histological examination and cytology were the primary diagnostic tools, with surgery used for confirmation in some cases. For a more comprehensive understanding of gynecological malignancies and their contributing risk factors, further research involving multiple centers with larger patient populations is recommended.

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Conflict of Interest: None

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Ethics Statement: The study adhered to the ethical principles outlined in the Helsinki Declaration, ensuring confidentiality and safeguarding personal information. No identifying details were disclosed. The data was securely maintained in an encrypted file by the investigator. Ethical approval was granted by the University of Tabuk's Ethics Committee (UT-282-125-2023).

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