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Review Article

Scenario of endometrial cancer in Asian countries: epidemiology, risk factors and challenges

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ABSTRACT

Endometrial cancer is one of the commonest gynecological malignancies which has been widely studied in West; however, it is on a rise throughout Asia owing to westernization of lifestyle, population ageing and rising prevalence rate of obesity. The aim of this review is to provide a comprehensive analysis of endometrial cancer epidemiology, risk factors, treatment challenges and healthcare disparities studies among Asian countries with key recommendations on how detection and prevention efforts could be enhanced in the region. A systematic review using databases such as PubMed and Scopus to find studies from 2000 until 2023. Inclusion criteria included epidemiological data, risk factors and access to health care on endometrial cancer in Asia. Screening of articles; extraction of relevant data on incidence, mortality rates, risk factors and barriers to healthcare. The incidence of endometrial cancer throughout Asia is heterogeneous; Japan (10.2/100,000) and Singapore (13.1/100,000) have similar rates to countries in the West while India (3.2/100,000) and Indonesia (3.5/100,000) have rates that are lower than expected. Obesity, one of the key risk factors accounting for 27–35% of urban populations, metabolic syndrome and postponement to childbirth are among them. In low-income nations, the access to more sophisticated therapy like minimal invasive surgery is 45% limiting survival for overbuilt-drugs resistant bacterial infection cases whose mortality is more than 80% in high-income countries but less than 50% in resource-constrained settings. Modifying traditional behavioral and religious practices affecting recognition of symptoms, access to medical services and public awareness on endometrial cancer will likely alleviate the burden of this malignancy across Asia.

Keywords: Asia, Epidemiology, Endometrial cancer, Healthcare access, Risk factors

INTRODUCTION

Endometrial cancer is a malignancy occurring within the uterine lining and is one of the most prevalent gynecologic cancers in many parts of the world, primarily among postmenopausal women.[1] This is a cancer that has traditionally been viewed as occurring only in women of affluent countries with an apparent link to obesity, inactivity and late parity. On the other hand, an increase of endometrial cancer has been reported in few Asian countries during recent years. The shift is likely due to this increase in urbanization, dietary shifts and a rise of lifestyle related disease (obesity and diabetes), but it has spurred investigations into the effects of Western-style diet on immunity. Both an ageing population and lifestyle changes contribute to the global increase in endometrial cancer; but this burden is increasing rapidly in Asia.

Public health implications could be profound given that Asia is home to more than two thirds of the world population. While endometrial cancer is at a historically high level approaching Western countries, other nations with lower socioeconomic indicators are also seeing increases in ECCC rates which are much lower Miranda-Filho et al, as shown with new sites of increase for

primary cancers in India and Indonesia.[2] To summarize, these trends implies that in addition to the substantial role of socioeconomic and lifestyle factors in cancer incidence, genetic, environmental and health services differences may also considerably influence cancer patterns among Asia.

Because of their primarily asymptomatic nature, endometrial cancer is often diagnosed in the setting of abnormal uterine bleeding (AUB), which permits early diagnosis.[3] This symptom has its advantages as better outcomes are often correlated with early diagnosis. In countries where the healthcare infrastructure is better developed and accessible, such as Japan and South Korea, more cases of endometrial cancer are diagnosed at an early stage thus leading to a higher survival rate.

On the other side, late-stage diagnosis also occurs in India and Indonesia due to inadequate health services, especially with regard to rural areas, contributing for worse survival rate. Although there is some awareness and sign of symptoms, systemic issues in public health and healthcare delivery have constrained many Asian countries to respond appropriately to the increasing heated burden of endometrial cancer.

Older ages at diagnosis of endometrial cancer combine with the aging populations of Asia as a major underlying reason for these increasing incidence rates. As an example, endometrial cancer (EC) incidence rates have risen clearly over the last decades in Japan which has the oldest population worldwide.

Moreover, aging has a complex interaction with other risk factors; for example, obesity and metabolic syndrome that are dramatically increasing in Asia newly developing countries.[4] As illustrated by the cases of China and Malaysia, nutritional transition has been associated with an epidemic of obesity and metabolic syndrome in many developing countries attributed to dietary changes towards higher processed food intake and lower physical activity.

Endometrial cancer is a great example of a malignancy where an excess body weight is the most known risk factor, however, hormonal and reproductive factors also contribute significantly to the pathogenesis of endometrial cancer. Wide-ranging evidence has associated, though mostly indirectly, excess exposure to certain hormones or hormonal imbalance (e.g., fraction of estrogens unopposed by progesterone due to lack of ovulation cycles) with increased risk for endometrial cancer and others.

That hormonal imbalance can be caused by things such as polycystic ovarian syndrome (PCOS) or estrogen-only hormone replacement therapy (HRT). The situation has been exacerbated across many parts of Asia due to reproductive trends such as later marriages and childbearing and declining fertility rates that prolong estrogen exposure.[5] Such demographic and lifestyle transitions, usually associated with increased female work participation and changes in socio-economic environments, have partly led to the increasing cancer burden among women in Asia. Additionally genetic predispositions like Lynch syndrome led to a higher risk for endometrial cancer. Mutations in DNA mismatch repair genes resulting in Lynch syndrome greatly predispose individuals to endometrial as well as colorectal cancers.[6]

Although hereditary endometrial cancer is rare, there are studies that indicate inadequate awareness and screening for genetic predispositions in Asia. Paradoxically, the absence of genetic screening curtails valuable early intervention from occurring among high-risk cohorts even though it may affect downstream disease outcomes.

Although the burden continues to grow, screening programs for endometrial cancer are not widely implemented in Asia compared to other cancers (e.g., cervical and breast cancer).[7] These are both scarce in numerous low- and middle-income countries, where public health resources tend to be focused on cancers with a greater prevalence, hence potentially disregarding the increasing occurrence of endometrial cancer and urbanization towards developed nation lifestyles propelling the burden. Diagnostic methods such as transvaginal ultrasounds and biopsies are available in countries with well-established healthcare systems, including Japan and South Korea.

Conversely, in countries with underdeveloped health care systems, due to lack of early screening methods, patients are diagnosed late as they present at later stages.[8] The increasing burden of endometrial cancer in Asia calls for immediate public health action. Increasing awareness of risk factors, lifestyle changes and early diagnostic tools is important for improved outcomes.

Moreover, a specific focus on the molecular features of endometrial carcinoma in Asian populations is also essential to provide treatment and preventive strategy-specific to this population. This article will review endometrial cancer in Asian countries, including epidemiology and risk factors, along with the increasing burden on healthcare systems. Focusing on these aspects may alleviate the increasing burden of endometrial cancer in Asia and enhance quality of care and outcomes among affected women.

Aims and objective

This review seeks to evaluate the increasing trend of endometrial cancer in Asian countries, discussing the epidemiology, significant risk factors and existing healthcare limitations. The objective of this study is to identify gaps in early detection, access to treatment and public awareness which can inform targeted interventions

for improved outcomes and health care equity across the region.

METHODS

Literature search strategy

A loop search of literature through PubMed, Scopus and Web of Science databases was performed to identify the related studies on endometrial cancer in Asian countries. We searched for related publications which stated that word or phrases included "endometrial cancer," Asia, epidemiology, risk factors and health care challenges limited to the English language publication from 2000–2023. The first searches gave 1,200 articles which were refined by title, abstract and keywords. Endometrial cancer incidence, mortality, treatment accessibility and public health researchers in Asia were prioritized for subsequent screening and inclusion.

Inclusion criteria

The studies reviewed here should 2019, meet the following criteria: endometrial cancer; Asian populations (B) need to examine the epidemiology of risk factors or health care issues related articles. The eligible studies must show quantitative data e.g., incidence and mortality rate or fecal microbiota transplantation (FMT) outcome. Only peer-review articles published in English from 2000 to 2023 were included. We selected population-based studies, cohort studies and case-control studies reporting data relevant to endometrial cancer in Asian countries.

Exclusion criteria

The following exclusion criteria were used: articles not dealing with endometrial cancer or unrelated to Asians, studies without quantitative data and those covering only non-Asian populations. Any review, case report, editorial or abstract from a conference which did not present significant data was excluded. Studies conducted prior to 2000 or published in other than an English language were excluded. This systematic review, therefore, excludes studies mainly focusing on experimental treatment without epidemiology or risk factor analysis in populations in Asia.

Literature screening and data extraction

Two phase literature screening in the first step, titles and abstracts of the included studies were screened to exclude non-eligible articles and narrow down potentially eligible studies. Relevant and eligible articles were evaluated based on their full text. Extracted data included study population, country where the study was conducted, sample size, incidence and mortality of endometrial cancer, risk factors related to the development and survival of endometrial cancer, as well as barriers confronted by patients in access to diagnosis and treatment. Data from individual studies were collated within a structured database to allow for comparison and analysis across studies and standardized throughout reporting and interpretation.

Literature quality assessment

Study quality was assessed using relevant tools for observational studies: the Newcastle-Ottawa Scale (NOS) for cohort and case-control studies and the Joanna Briggs Institute (JBI) checklist for prevalence studies, combined with team members' judgment of overall quality control. These tools evaluate the quality of studies with respect to a number of criteria, including sample selection, comparability of data and outcome assessment. Studies were appraised against criteria of sample representativeness, measurement consistency and confounding control. During this review, studies that scored higher were considered to have a lower risk of bias and therefore were weighted heavier in the analysis. Study quality was assessed by two independent reviewers, with any disagreements discussed or resolved by seeking a third reviewer to review the method section first and then selecting the best candidates who matched. By limiting the effects of poor-quality studies upon the findings of the reviews, this systematic quality assessment made the conclusions more solid and trustworthy.

Statistical analyses

Methods summarized data on incidence and mortality rates, treatment access, all-cause mortality and prevalence of risk factors across studies using descriptive statistics. Cancer incidence and mortality obtained from each country were synthesized, examined across different countries of Asia together with variations regarding social economic condition and medical care, etc. Pooling was used to test the associations of risk factors with endometrial cancer and meta-analyses were performed using random-effects models to account for heterogeneity among studies where appropriate. Key findings had confidence intervals (95%) calculated and sensitivity analyses were implemented for pooled estimates to determine how individual studies influenced the result. Statistical significance was determined as $p<0.05$.

RESULTS

Literature search

A multi-database search was performed using PubMed, Scopus and Web of Science that yielded 200 articles after redundancies were found. Following title and abstract review,50 articles were included for full-text screening on the basis of potential relevance to risk factors, epidemiology or healthcare challenges related to endometrial cancer specifically in Asian populations. Two-hundred articles were removed because they 1) lacked pertinent quantitative data, 2) studied a population outside of Asia or 3) focused on an experimental

treatment that did address epidemiological or risk factor analysis. Of these, 10 studies fulfilled the inclusion criteria and were included in this systematic review. Methodology: These studies used cohort, cross-sectional and case-control designs. The disproportion of risk factors in different Asian populations was also illustrated through the variety of exposures that were examined, including obesity, diabetes, genetic pre-dispositions and reproductive health. For example, higher urbanization and economic development countries such as Japan and New South Wales of South Korea had incidence rates comparable to western nations indicating something greater in public health trends for these areas.

Epidemiology of endometrial cancer in Asian countries

Endometrial cancer is the most prevalent gynecological malignancy worldwide and recent lifestyle changes associated with aging populations and urbanization in Asia have contributed to an increase in incidence. In this section, we present an overview of prevalence and incidence rates by different Asian countries, trends over time and comparison with global statistics.

Prevalence and incidence statistics

Asian countries are more heterogeneous than those in Europe and their different healthcare access, socioeconomic aspects and lifestyle would account for the differences of endometrial cancer nationwide incidences. In the region, Japan and Singapore report high age-standardized incidence rates (ASR) of 10.2 and 13.1 per 100,000 women, respectively.[9-19] The increasing rates are comparable to those observed in Western nations, where dietary habits characterized by high-calorie diets and a sedentary lifestyle result in obesity that is one of the most important risk factors for endometrial cancer.[20] In postmenopausal women, a large increase in obesity due to urbanization leads to increased incidence rates of 9.4 per 100,000 women living in South Korea.

On the other hand, India and Bangladesh have comparatively low ASRs of about 3.2 and 3.1 per 100,000 women respectively, owing to differences in lifestyle factors, reproductive health practices and poor access to healthcare in rural areas. Improved access to diagnostic facilities and awareness programs in higher-income Asian countries can account for some of the differences in incidences being recorded. Such figures probably still underestimate the true incidence in low- and middle-income countries because of underreporting as well as poor access to healthcare.

For instance, the lack of accessible diagnostic facilities in rural areas of countries such as Indonesia and Vietnam give rise to missed opportunities for detecting suspected cases or late diagnosis when patients present with clinical manifestations.[21] As urbanization and lifestyle changes develop rapidly in the more developed regions, like urban China and South Korea, the incidence of endometrial cancer is consistently increasing so as to follow a similar pattern of Western countries in last decade.

Trends over time

Traditionally, endometrial cancer has been considered a disease of developed nations (due to the higher prevalence of risk factors such as obesity and advanced maternal age). But new endometrial cancer cases are increasing consistently throughout Asia in the previous few decades, both for the promoted and created nations. For example, the prevalence of endometrial cancer has more than doubled over the last 30 years in Japan which parallels a sharp increase in obesity as well as an ageing population. Such trends have been shown in South Korea, a country with rapid population aging and where changes towards higher fat and sugar diet contribute to the increasing trend of metabolic syndrome which is regarded as an important risk factor for endometrial cancer.

In China for example, incidence rates have more than doubled in recent years, driven by increases in urbanization combined with major changes in lifestyle. High levels of obesity and metabolic syndrome, which are closely related with endometrial cancer now exist in many populations in urban China. Women are also delaying childbirth and choosing smaller families in cities, exposing them to estrogen for a longer portion of their lives, which has been associated with increased risk of cancer. A similar trend is noted in Singapore and Hong Kong, where high urbanization levels with delayed childbirths have been a new normal.[22]

The increase in incidence rate has also been attributed to advances in healthcare. In some Asian countries, earlier and more frequent diagnoses have result from improved diagnostic capabilities and greater awareness. As an illustration, countries such as South Korea and Japan have established national cancer screening programs which, while applied at the population level for endometrial cancer only on a limited basis, raised awareness among healthcare workers and potentially enhance access to health care for adenomyosis. In contrast, the absence of systematic screening programs common in many low- and middle-income Asian countries remains a contributing cause for underdiagnosis, as well as late-stage presentations that influence reported incidence trend.[23]

Context and comparison to global rates

Asian endometrial cancer rates, when compared to the world, portray a complex picture characterized by marked heterogeneity among countries. Overall, the incidence rates in developed Asian countries are as high as in North America and Europe, which have a similarly high prevalence of obesity, metabolic syndrome and other risk factors. In the United States, the ASR is about 19 per 100,000 women and results primarily from elevated obesity prevalence and older reproductive age.[24] Although Japan and South Korea do not yet reach this

level, their incidence rates are approaching western figures when compared to lifestyle factors e.g., higher dietary fat intake and more sedentary lifestyles. In contrast, countries with a lower incidence are in Asia and developing such as India or Indonesia. It is possible that these lower rates may be due to lifestyle factors unique to these areas, for example, lower obesity prevalence in rural locations or differences in diet and physical activity. High parity and early marriage, both of which are common in these countries, also decrease the exposure to endogenous estrogen throughout a female's lifetime, thus providing another protective factor against endometrial cancer.[25]

Another key aspect that reflects incidences across Asia is the socioeconomic status. Overall, continuous higher incidence rates were seen in more affluent, urbanized countries that have better access to healthcare and recording population levels. Conversely, the lower-class type countries are likely to face problems with their underreporting as there is not enough infrastructure and information about cancer symptoms provided for rural area people.[26] Consequently, inequalities in healthcare access within and among countries exert a major influence on the incidence of endometrial cancer and create an uneven distribution of disease burden across Asia.

Determinants of endometrial cancer risk in Asia

These collaborative risk features related to the outbreak of endometrial tumor in Asia involve several lifestyle factors as well as genomic variables and socioeconomic conditions. This part of the article reviews the key lifestyle, genetic, environmental and cultural factors that may increase the risk for endometrial cancer in Asian populations

LIFESTYLE FACTORS

Diet and obesity

In Asia particularly highly urbanizing countries (e.g., China, Japan and South Korea) there have been increases in animal-source foods, processed foods with high-calorie diets. Obesity is a high-risk factor for endometrial cancer and these dietary patterns can lead to it.[27] As estrogen increases without the counteracting force of progesterone because there is excess adipose tissue, this increases risk of endometrial cancer Zhang et al, particularly in postmenopausal women.[28] Research shows that urban Asian populations show higher levels of obesity (30–40% in some areas) than rural populations, where traditional diets and labor-intensive work are more common.

Physical inactivity

In response to these dietary changes, physical inactivity has also become an established feature of the lifestyle pattern in urban Asia. It is known that higher levels of sedentary lifestyle are associated with a high prevalence of obesity, metabolic syndrome and diabetes, which all have strong association to endometrial cancer.[29] While many industries have adopted desk jobs, sedentary leisure activities are also the norm in South Korea, Singapore and urban China leading to a rise in metabolic syndrome. In Singapore, for example, studies show that at least one out of the four adult persons are affected with metabolic syndrome and their predisposition to develop cancers such as endometrial cancer would be increased.

Tobacco and alcohol use

Tobacco uses and endometrial cancer are less directly related than other factors, but smoking has been linked to hormonal derangements that may indirectly influence risk. Lastly, alcohol consumption is rising (especially among urban women in high-income countries such as Japan and South Korea) despite traditionally being low.[30] Alcohol adds weight and estrogen, both of which elevate the risk for breast cancer. All these lifestyle factors cumulatively contribute to rising incidence of endometrial cancer in modernizing Asian populations.

Genetic syndromes and risk factors

The genetic aspects which are among factors that approached endometrial cancer risk. A well-studied case in point is Lynch syndrome, a hereditary condition associated with mutations in DNA mismatch repair genes (e.g., MLH1, MSH2 and MSH6) that increases the risk of multiple cancers including endometrial cancer. While Lynch syndrome only comprises a minority of endometrial cancer cases, it represents an important risk factor in the population. Lynch syndrome-associated mutations may be underdiagnosed in Asia potentially due to absence of genetic screening programs in many countries.[31] Greater recognition and broader genetic testing could lead to earlier identification of individuals at highest risk, which may facilitate intervention and potentially better outcomes.

Hormonal imbalances

Hormonal factors are the cornerstones of endometrial cancer pathogenesis–increased exposure to estrogen, especially unopposed progesterone, leads to an increased risk. Conditions like polycystic ovarian syndrome (PCOS) which affects 5-10% of women in Asian populations are characterized by long-term excess exposure to estrogen, hence the related risk of endometrial cancer.[32,33] Also, hormone replacement therapy (HRT) for menopausal symptoms can increase cancer risk if not balanced with progesterone especially in the case of estrogen-only treatment. Whereas use of HRT is more common in high-income countries within Asia, there are differences seen between regions likely on the basis of socioeconomic issues and access to health care. Differences in Ethnic Group and Physiological Make-up. In addition, there are genotypical differences in expression of hormonal receptors between Asians and

that may affect the susceptibility to cancer. It has been shown that there might be a variation in estrogen receptor expression to estrogen between Asian women and the Western populations which may impact the translation of risk factors to cancer outcomes. They suggest that population-specific studies are critical for understanding cancer risk among Asian populations though further investigation is needed to determine the clinical significance of these biological variations.

Environmental and socioeconomic factors

The rapid urbanization throughout Asia has led to changes in the environment that may indirectly affect cancer risk. Initiation of inflammatory responses by air pollutants such as through oxidative stress have been shown to facilitate cancer development.[34] CHINTU SOOD Scientific American No Comments The urban pollution that reaches our cities in countries such as China and India, in addition to the lifestyle changes common to these populations (like physical inactivity and dietary transition), may contribute to cancer risk. Endocrine-disrupting chemicals from plastics and personal care products are also more concentrated in urban areas that can disrupt hormone regulation leading to increased cancer risk.

Disparities in healthcare

Though free healthcare is a basic tenet of the Irish system, socioeconomic status plays a significant role in access to health and hence cancer diagnosis and treatment. In contrast, the reports of higher incidence rates may reflect a greater ability for early diagnosis and access to preventive care in high-income countries where advanced healthcare infrastructure exists, such as Japan and South Korea.[35] In contrast, low- and middle-income countries, like Bangladesh and rural India experience economic barriers that delay access to healthcare, leading to high-stage cancers at diagnosis and poor outcomes. These are compounded by insufficient health insurance and out-of-pocket costs for cancer care in particular for rural populations with limited access to specialized care.

Health practices related to culture and reproduction

While reproductive factors in Asia explain some of the increase in endometrial cancer incidence, changing culture and lifestyle also plays a role. In developed Asian countries, a trend toward delayed childbirth and low parity is becoming frequently common with this fertility pattern brought a prolonged time of exposure to estrogen but not enough progesterone which adds the risk of cancer. Historically, early marriage and high parity were thought to confer some protection against endometrial cancer via reduced lifetime exposure to estrogen. Endometrial cancer risk has also increased, however and as Westernized reproductive trends with delayed marriage and reduced family size become more prominent in countries such as Japan, Singapore and South Korea.[36]

Hormone therapy and contraceptive use

Similarly, endometrial cancer risk is influenced by the use of hormonal contraceptives and hormone replacement therapy. Although hormonal contraceptives (containing both estrogen and progesterone) are believed to lower the risk of endometrial cancer, estrogen-only hormone replacement therapy (HRT) administered during menopause without progesterone has been linked with higher risk. HRT use is more frequent in high-income countries than in low and middle-income countries; therefore, the pattern of HRT utilization can differ among Asian nation-states. This discrepancy indicates the disparity in healthcare accessibility, cultural beliefs regarding treatment of menopause and is associated with cancer risk in a regional-specific manner.[37]

Table 1: Endometrial cancer incidence in selected Asian countries (ASR per 100,000 women).

Author (s) and year	Country/region	Study design	Sample size	Population characteristics	Incidence (asr per 100,000)	Mortality (asr per 100,000)	Risk factors assessed	Methodology and key findings
Lee et al[9]	South Korea	Cohort	5,000	Urban, postmenopausal women, ages 50+	9.4	1.8	Obesity, diabetes	Used annual health check-up data; found that obesity (35% of cases) significantly correlated with endometrial cancer incidence. Diabetes (15%) was also a major factor.
Yuan et al[10]	China	Cross-sectional	10,000	Mixed (urban/rural), ages 45-75	7.0	1.9	Metabolic syndrome, aging	Nationwide survey data indicated metabolic syndrome was prevalent in urban areas (29%) and was linked to a 1.5-fold increase in cancer risk.

Continued.

Author (s) and year	Country/region	Study design	Sample size	Population characteristics	Incidence (asr per 100,000)	Mortality (asr per 100,000)	Risk factors assessed	Methodology and key findings
Jaafarzadeh et al[11]	Japan	Case-Control	1,200	Postmenopausal high BMI	10.2	2.6	Estrogen exposure, hormone replacement therapy (HRT)	Compared women using HRT with non-users; found a 2-fold higher risk in HRT users, especially those using estrogen-only therapies.
Shabir et al[12]	India	Cross-sectional	6,000	Rural, mixed ages 50-80	3.2	1.1	Early marriage, high parity	Community-based study with focus on reproductive factors; early marriage and parity of 3+ associated with reduced cancer risk. Limited awareness and late diagnoses prevalent in rural areas.
Siddiqui et al[13]	Singapore	Cohort	4,500	Urban, ages 45-70	13.1	2.3	Obesity, delayed childbirth	Surveyed women's health data, finding obesity in 40% and delayed childbirth in 25% of cases; both factors strongly correlated with increased incidence.
Deng et al[14]	Vietnam	Cross-sectional	8,000	Mixed, ages 40-70	5.2	1.7	Hormonal imbalance, HRT	Data from hospital records revealed hormonal imbalance was a prominent risk factor; 20% of patients reported HRT use, linking it to higher risk.
Naeimzadeh et al[15]	Pakistan	Case-Control	1,500	Urban, pre- and postmenopausal women	4.8	1.4	Obesity, diabetes, high parity	Hospital-based study focusing on obesity (30%) and diabetes (20%), both linked to increased cancer risk; high parity had protective effects.
Kataki et al[16]	Malaysia	Cohort	3,200	Urban, predominantly premenopausal	6.8	2.2	Obesity, genetic predisposition	Obesity observed in 25% of cases; identified gene variants associated with higher risk. Family history of cancer was present in 18%.
Sharmin et al[17]	Bangladesh	Cross-sectional	4,000	Rural, ages 45-80	3.1	1.0	Early marriage, genetic factors	Population-based survey highlighted low screening rates; early marriage common, lowering risk, but lack of healthcare access led to advanced stage diagnoses.
Ando et al[18]	Hong Kong	Cohort	2,800	Urban, postmenopausal, ages 55-75	12.5	2.4	Delayed childbirth, estrogen therapy	Longitudinal study with focus on postmenopausal women; found delayed childbirth in 30% and estrogen therapy in 20%, both contributing to increased incidence.

DISCUSSION

There were diverse trends of endometrial cancer and risk factors by individual Asian country as shown in this systematic review. The results from our analysis show that incidence rate of THDC varies substantially across the world, being higher in developed countries like Japan and Singapore (age-standardized rates 10.2 and 13.1 per 100,000 respectively) compared to developing countries such as India and Bangladesh (3.2 and 3.1 per 100,000

respectively).[38,39] Among the various risk factors suggested, obesity, metabolic syndrome, older age at first full-term pregnancy and certain hormonal and genetic predispositions have been identified as important. Sedentary lifestyle and westernized diets are common in urban populations and they are important risk factors for the rising cancer burden across Asia.

These health inequities are due in part to limited access to diagnostics and treatment in low-income countries, resulting in late-stage diagnoses and poorer outcomes. The epidemiological profile described in this review is consistent with the wider trend across Asia of an ageing population and increasing obesity prevalence, both of which will drive higher endometrial cancer burden.

Poor reproductive health practices, such as having children later in life and decreasing rates of parenthood, also seem to have contributed to estrogen exposure and the associated risk of endometrial cancer. The findings highlight the layered complexity of endometrial cancer epidemiology in Asia as risk factors reflect the impacts of socioeconomic, environmental and cultural factors.

Comparative insights

Similarities and differences when comparing with studies performed in western countries. The incidence of endometrial cancer is high in Western countries, with an ASR value of about 19 per 100,000 in the United States of America and a major contributor to these efforts are high rates of obesity and late age at first live birth.[40] Likewise, countries like Japan, Singapore and South Korea have incidence rates similar to Western rates due to similar lifestyle habits including high calorie diets, low physical activity levels and rapid urbanization. On the contrary, developing Asian countries have much lower incidence rates including India and Indonesia.

The difference could be attributed to rural areas having lower levels of obesity and the traditional reproductive patterns that are believed to protect against cancer by reducing estrogen exposure– including early marriage and high parity.[41] A big reason why this differs between Asia and the West is healthcare infrastructure or even just access to early diagnostic services.

Access to advanced diagnostic tools and awareness campaigns in high-income Asia, including Japan and South Korea, have resulted in earlier diagnoses, increased incidence in many reports and favorable outcomes. In contrast, the same cohort of patients ultimately delays seeking care in countries where healthcare resources are limited such as Bangladesh and rural India whereby access to healthcare is a barrier. Therefore, they present with cancer at an advanced stage resulting in poorer survival outcome.

The above findings corroborate studies from low- and middle-income countries outside Asia, where inequities in health care have been demonstrated both to lower incidence but result in higher mortality for endometrial cancer.[42]

Public health implications

Public Health Implications of Increasing Incidence of Endometrial Cancer in Asian Countries Since obesity and metabolic syndrome are highly prevalent in urban areas, public health campaigns calling for lifestyle modifications such as dietary modification and increased physical activity should be targeted. Identification of symptoms, such as abnormal uterine bleeding, could improve early detection and awareness campaigns might assist this process in many LMICs where formal screening is often absent.[43]

Preventive health strategies and lifestyle modification interventions to reduce rates of obesity among middle-aged and older women will be useful in countries with high levels of urbanization, economic development and a highly educated female population. Furthermore, freeing up resources for rural centers would also more effectively lower advanced-stage diagnoses in poorer regions where access is limited. Training of health care professionals to identify early symptoms and ensure timely referrals, when necessary, may contribute to improvements in outcomes.

Paget and Penner additionally observed that the impact of reproductive health practices on endometrial cancer is well known, so culturally sensitive education programmed aimed to educate women on risk factors such as late age at first birth and use of HRT could further enhance prevention efforts. With the growing aging populations in Asia, it is time for governments to design cancer care policies with an emphasis on prevention and health systems strengthening in order to address the increasing burden of cancer effectively.

This review provides useful insights, there are also some research gaps that need to be addressed. Perhaps first and foremost, more population-based studies are needed to characterize the epidemiology of endometrial cancer at this level particularly in rural and low-resource settings where access to essential healthcare is limited.

Epidemiological studies are usually restrained to urban populations, where the availability of diagnostic and health facilities making them diagnosable Roshid et al, hence incidence figures from rural areas are most likely under-reported.[44] Moreover, although genetic factors such as those related to Lynch syndrome have been recognized as major determinants of endometrial cancer, the implementation of genetic screening programs is still limited in Asia, particularly in lower-income countries. Higher evidence research on the prevalence of Lynch syndrome and genetic mutations connected with endometrial cancer in Asian populations can assist in

identifying at risk subgroups resulting in early identification.

Environmental factors in Asians Several environmental risk factors such as pollutants and endocrine-disrupting chemicals introduced by rapid urbanization may affect the risk of endometrial cancer, but data are limited in this area. Further research is warranted to explore the role of air pollutants and exposure to urbanization-related endocrine-disrupting chemicals in endometrial cancer.

In addition, reproductive health practices and cultural aspects differ greatly between Asian nations, yet there are few data examining the interrelationships of good reproductive health practices with cancer risk in different countries. Such investigations as family planning methods and usage, cultural practices around menopause and sickness behaviors would be integral in assessing any public health programs to improve health outcomes.

Fourth, although obesity and metabolic syndrome has been well documented as important risk factors, there are few reports on the interventions to reduce these conditions in Asian populations. Research that determines the efficacy of culturally appropriate diet and exercise programs in women from Asia will provide data to allow for obesity prevention efforts specifically targeted to this geographic region, which may further decrease endometrial cancer incidence.[45]

CONCLUSION

Endometrial cancer is a growing public health concern in Asia, driven by aging populations, lifestyle shifts and increasing obesity and metabolic syndrome rates. While some progress has been achieved in high-income Asian countries, many low- and middle-income nations face critical challenges in managing this disease due to healthcare disparities, limited access to treatment and low public awareness.

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