

The Incidence of Uterus Cancer in Iran: A Systematic Review

Abbas Rezaianzadeh,¹ Seyedeh Leila Dehghani,² Masoomeh Mousavi,^{2*} and Ramin Rezaeianzadeh³

¹Colorectal Research Center, Shiraz University of Medical Sciences, Shiraz, Iran

²Student Research Committee, Shiraz University of Medical Sciences, Shiraz, Iran

³Biology Department, Islamic Azad University, Zarghan Branch, Zarghan, Iran

*Corresponding author: Masoomeh Mousavi, Student Research Committee, Shiraz University of Medical Sciences, Shiraz, Iran. Tel/Fax: +98-713725100, E-mail: mousavi68.ma@yahoo.com

Received 2016 October 09; Accepted 2016 October 10.

Abstract

Background: Uterus cancer is one of the main causes of death in the female population, which mostly occurs in low- or middle-income countries. Up to now, many descriptive studies have been conducted on the prevalence of uterus cancer in Iran and its relationship with various factors. Thus, the present study aimed to summarize the data relevant to the incidence of uterus cancer in Iran.

Methods: All the published reports on the incidence of uterus cancer in Iran were gathered through exploration of international journals. Accordingly, population-based articles and those that defined the topic clearly and reported age-specific rate (ASR) were included in the study. In order to extract the required information, all the articles were studied carefully and some were entered in the report.

Results: Out of the 130 articles, three were selected through careful screening for the final report. These studies were performed on 1086, 8359 and 652 cases and reported ASRs of 0.01, 0.027, and 0.026 in 1000 individuals, respectively.

Discussion: In this study, the incidence of uterus cancer and its geographical diversity in Iran was systematically taken into consideration for the first time. A total of 19875 individuals were studied in three selected articles. The results indicated that the incidence of this cancer followed an ascending trend.

Keywords: Uterus, Cancer, Systematic Review, Incidence

1. Context

Uterus cancer refers to any kind of aggressive neoplasm in the uterus. Aggressive neoplasms in female's pelvic organs comprise 15% of all cancers amongst females, with uterus cancer being the most prevalent one. According to statistics, 54870 cases of uterus cancer are diagnosed annually, 10170 cases of which end in death (1). Uterus cancer is also the most prevalent malignancy among females in the United States and developed countries, who have access to appropriate healthcare services. In these communities, about 95% of malignancies are related to endometrial cancer (2). Uterus cancer is also the tenth prevalent cancer in Europe and the fourth one among European females. In Europe, the highest and lowest age-specific rates (ASR) of the incidence of uterus cancer was related to Macedonia and Greece, respectively. In England, uterus cancer was the most prevalent cancer and was known to be the fourth prevalent cancer among females. In 2010, nearly 6834 new cases of this cancer were detected in England (3). Furthermore, uterus cancer was known as the 6th prevalent cancer in the world, and with 239000 new diagnoses in 2012, it was reported to be the 4th prevalent cancer among females (4). The highest and lowest incidence rates of uterus cancer were related to Central Asia and North America, re-

spectively. Nonetheless, it should be noted that differences in the statistics reported in different countries were related to the prevalence of various risk factors and screening and diagnostic methods (4). Moreover, uterus cancer is more prevalent among black females regardless of its histological type. The ASR of uterus cancer in white females ranged from 16.19 to 17.7 in 100000 population. This measure ranged from 10.7 to 18 in 100000 individuals in Asian females and from 13.7 to 23.6 in 100000 individuals in black cases (2, 5).

Studies performed on thousands of patients affected by cancer have demonstrated that the five-year survival of the females affected by uterus cancer was above 82%. Indeed, the 10-year survival of patients with uterus cancer was 79%. These studies also indicated that the five-year survival rate would be 95% in case cancer was diagnosed at the early stages, while it would decrease to 68% in case of cancer progression. On the other hand, if the cancer involved other body organs, the five-year survival would decrease to 17% (6).

In Iran, cancer is the third known reason for death. Besides, malignancies related to female's genital system are known as the third malignancy among females. Although the incidence of these cancers is higher in developed coun-

tries compared to some other countries, the incidence of uterus and cervical cancers are higher in developing countries in comparison to most other countries (7). The frequency of uterus cancer was 2.8 in 100000 population in Iran, which has been increasing threateningly during the last two decades (8). According to the statistics, uterus cancer has been recognized as the fifth prevalent cancer among Iranian females (9). The present study aimed to summarize the data relevant to the incidence of uterus cancer in Iran.

2. Materials and Methods

2.1. Information Source

The researchers searched all the published reports on the incidence of uterus cancer in Iran in international databases. These databases included Science Direct, Springer, PubMed, Elsevier, Emro, Cinhal, Proquest and Medline. Some Iranian databases, such as Iran Medex, Scientific Iranian Database, Magiran, Novin Pajouh, Islamic world science citation center (ISC), and Iranian research institute were searched, as well. The following keywords were employed: uterus cancer or uterine neoplasms incidence (prevalence), or occurrence or frequency.

2.2. Study Selection

The articles included in this study provided a clear definition of the population under investigation as well as evident criteria for detecting uterus cancer. In other words, the articles reporting the rate of cancer deaths were selected and those on the prevalence rate were omitted. In this way, the actual data on the incidence of cancer were provided. Repeated articles and interventional studies were also excluded from the analysis.

2.3. Data Collection

After reviewing the articles, three were included in the report. These studies met the following criteria:

- a) The sample size was reported separately.
- b) The ASR in 1000 individuals was provided.
- c) The 95% confidence interval was reported.

3. Results

At first, 130 articles were found during the screening stage. Then, 119 articles were omitted because they were not appropriate for the study based on their abstracts and titles. After that, 11 selected studies were considered again and two were removed since they were repeated. The remaining nine articles were analyzed again and six were omitted due to being incomplete. Finally, three articles

were selected for this systematic study. These three studies were conducted on 19875 individuals. The information about these three articles has been summarized in [Table 1](#).

The lowest annual ASR per 1000 individuals was reported to be 0.01 in Fallahi's article. That study was conducted on 10864 participants in five provinces, namely Ardabil, Guilan, Mazandran, Golestan and Kerman. On the other hand, the highest annual ASR per 1000 individuals was reported to be 0.027 in Fazel's study, which was carried out in Golestan province.

4. Discussion

This systematic analysis was conducted on the incidence of uterus cancer and its diversity all over Iran for the first time. This study was performed on three articles including 19875 participants. The results of these studies revealed that the incidence of uterus cancer followed an ascending trend. Besides, the prevalence of uterus cancer among Iranian females was not considerably lower than that in EMRO countries, which corresponds to the first report by the world health organization (WHO).

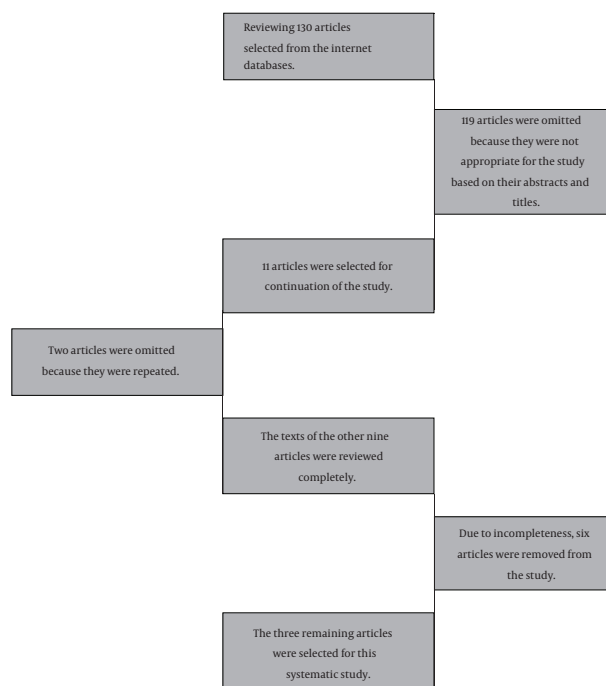
The global ASR of uterus cancer is 8.3 per 100000 females. However, the findings of the three selected articles in the present study indicated that this rate was significantly lower in Iran. Additionally, Iran had a better status in comparison to India with ASR of 2.3 (10). In Britain, the ASR increased from 17.3 to 29.3 per 100000 individuals from 1979 to 2013, which is in line with the increasing trend demonstrated in the current study (11).

Furthermore, the present study results revealed different ASRs in Iran's various provinces. This might be attributed to effective factors in the incidence of uterus cancer, such as obesity, genetics, race and skin color, which have also been reported in other studies (5, 12). Generally, the risk factors of uterus cancer can be classified to two categories, the first of which includes family history, older age (average of 60 years), polycystic ovarian syndrome and obesity. In addition, the second category that involves internal factors includes estrogen without the presence of progesterone, treatment by tamoxifen and history of radiotherapy (13). According to the obtained ASR in the three selected articles in our study, the incidence of uterus cancer was somewhat lower in Iranians in comparison to countries, such as Kuwait, China and Spain, which have a low incidence of cancer.

In general, human papilloma virus infection spreads in more than 90% of malignancies, and females, who have various sexual contacts with different partners are more exposed to this viral infection, which is known as a risk factor for uterus malignancies (14-18). The low ASR in Iran can be attributed to religious beliefs and their effective role in

Table 1. Details of the Selected Articles That Had the Required Criteria for the Study

Corresponding Author	Data Collection Year	Province	Sample Size	ASR of 1000 Population in a Year	Confidence Interval 95%	
					Minimum	Maximum
Fazel	2004 - 2010	Golestan	652	0.026	0.016	0.041
Masoompor	1998 - 2002	Fars	8359	0.027	0.024	0.031
Fallah	1996 - 2000	Ardabil, Gilan, Mazandaran, Golestan, Kerman	10864	0.010	0.008	0.012

**Figure 1.** Flowchart of the Selected Studies

this malignancy. In other words, these factors can have a controlling effect on the incidence of uterus cancer (19).

In conclusion, it should be noted that according to the 95% confidence interval obtained for the three articles included in the current systematic review, Fallahi's study might be a stronger reference because it was conducted in five provinces with a larger sample size, which caused the the highest and lowest confidence intervals to be smaller compared to the other two studies.

5. Conclusion

This systematic review was conducted on the incidence of uterus cancer and its geographical diversity in Iran. The results indicated that the incidence of this cancer followed

an ascending trend.

Acknowledgments

The authors would like to thank Ms. A. Keivanshekouh at the research improvement center of Shiraz University of Medical Sciences for improving the use of English in the manuscript.

References

1. Siegel RL, Miller KD, Jemal A. Cancer statistics, 2015. *CA Cancer J Clin*. 2015;**65**(1):5-29. doi: [10.3322/caac.21254](https://doi.org/10.3322/caac.21254). [PubMed: [25559415](https://pubmed.ncbi.nlm.nih.gov/25559415/)].
2. del Carmen MG, Birrer M, Schorge JO. Uterine papillary serous cancer: a review of the literature. *Gynecol Oncol*. 2012;**127**(3):651-61. doi: [10.1016/j.ygyno.2012.09.012](https://doi.org/10.1016/j.ygyno.2012.09.012). [PubMed: [23000148](https://pubmed.ncbi.nlm.nih.gov/23000148/)].

3. Office for National Statistics . Cancer statistics registration 2010. Available from: <http://www.ons.gov.uk/ons/publications/rereferencetables.html?edition=tc%3A77-262496>.
4. Ferlay J, Steliarova-Foucher E, Lortet-Tieulent J, Rosso S, Coebergh JW, Comber H, et al. Cancer incidence and mortality patterns in Europe: estimates for 40 countries in 2012. *Eur J Cancer*. 2013;**49**(6):1374–403. doi: [10.1016/j.ejca.2012.12.027](https://doi.org/10.1016/j.ejca.2012.12.027). [PubMed: [23485231](https://pubmed.ncbi.nlm.nih.gov/23485231/)].
5. National cancer intelligence network and cancer research UK. Cancer incidence and survival by major ethnic group, 2002-2006. 2009
6. American Society of Clinical Oncology . Understanding statistics used to guide prognosis and evaluate treatment 2005-2016. Available from: <http://www.cancer.net/navigating-cancer-care/cancer-basics/understanding-statistics-used-guide-prognosis-and-evaluate-treatment>.
7. Taheri N, Fazel A, Mahmoodzadeh H, Omranpour R, Roshandel G, Gharahjeh S, et al. Epidemiology of female reproductive cancers in Iran: results of the Golestan Population-based Cancer Registry. *Asian Pac J Cancer Prev*. 2014;**15**(20):8779–82. [PubMed: [25374206](https://pubmed.ncbi.nlm.nih.gov/25374206/)].
8. Iranian society of clinical oncology . 2013. Available from: <http://isco.ir/index.php/component/content/article/8-books/8-cancer-in-iran.html>.
9. Kolahdoozan S, Sadjadi A, Amir Reza R, Khademi H. Five common cancers in Iran. *Arch Iranian Med*. 2010;**13**(2):143.
10. Rajaram S, Chitrathara K, Maheshwari A. Uterine cancer: diagnosis and treatment. Springer; 2015.
11. Soy intake and risk of endocrine-related gynaecological cancer: A meta-analysis Available from: https://www.researchgate.net/publication/26832540_Soy_intake_and_risk_of_endocrine-related_gynaecological_cancer_A_meta-analysis.
12. American society of clinical oncology . Uterine cancer: Risk factors and prevention 2016. Available from: <http://www.cancer.net/cancer-types/uterine-cancer/risk-factors-and-prevention>.
13. Saso S, Louis LS, Doctor F, Hamed AH, Chatterjee J, Yazbek J, et al. Does fertility treatment increase the risk of uterine cancer? A meta-analysis. *Eur J Obstet Gynecol Reprod Biol*. 2015;**195**:52–60. doi: [10.1016/j.ejogrb.2015.09.002](https://doi.org/10.1016/j.ejogrb.2015.09.002). [PubMed: [26476799](https://pubmed.ncbi.nlm.nih.gov/26476799/)].
14. Kumar V, Abbas AK, Fausto N, Mitchell RN. Robbins basic pathology. 8 ed. Saunders Elsevier; 2007. pp. 718–21.
15. Kufe D. Holland-Frei cancer medicine. 8 ed. McGraw-Hill; 2009.
16. American cancer society . What Causes Cancer of the Cervix?. 200
17. Marrazzo JM, Koutsky LA, Kiviat NB, Kuypers JM, Stine K. Papanicolaou test screening and prevalence of genital human papillomavirus among women who have sex with women. *Am J Public Health*. 2001;**91**(6):947–52. [PubMed: [11392939](https://pubmed.ncbi.nlm.nih.gov/11392939/)].
18. Snijders PJ, Steenbergen RD, Heideman DA, Meijer CJ. HPV-mediated cervical carcinogenesis: concepts and clinical implications. *J Pathol*. 2006;**208**(2):152–64. doi: [10.1002/path.1866](https://doi.org/10.1002/path.1866). [PubMed: [16362994](https://pubmed.ncbi.nlm.nih.gov/16362994/)].
19. Alireza S, Mehdi N, Ali M, Alireza MJ, Reza M, Parkin DM. Cancer occurrence in Iran in 2002, an international perspective. *Asian Pacific J Cancer Prevent*. 2005;**6**(3):359.