J Nepal Health Res Counc 2024 Apr.-Jun.; 22 (63): 386-390

Burden of Reproductive Organ Cancer of Females in the Population-based Cancer Registry in Nepal

Gehanath Baral,[1] Sujanbabu Marahatta,[2] Sumer Singh[3]

[1]PhD Scholar (Public Health), Singhania University, [2]Nepal Open University, [3]Singhania University.

ABSTRACT

Background: There are sporadic facility-based reports but an information gap in the cancer burden in the community is apparent. To address this, the Nepal Health Research Council (NHRC) started a Population-based Cancer Registry (PBCR) in 2018 in the country. Thus, this study aims to identify the cancer burden in the female population, especially in the reproductive organs.

Methods: A quantitative database analysis of the Population-based Cancer Registry for year 2018 and 2019 was performed. Data entered in the TSV (Tab-separated values) files were imported to MS Excel and SPSS data Window and variables regrouped before analysis. The national census, WHO standardized population, and registry data were used for the descriptive analysis of the registry variables. Ethical approval was taken from the Ethical Review Board of NHRC.

Result: Out of 6854 cancer registries, the female population was 3590 with a male-to-female ratio of 10:11. This registry covers 10.75% of the country's population. The crude and age-standardized cancer incidence rates were 1.24% and 66.2 per 100,000 for the female population respectively. Reproductive organs (21%) and breast (19.7%) cancers are the most common in females, and out of reproductive organs cervical (58%) and ovarian (25%) cancers are the commonest. Surgery was the main treatment modality (32.7%) with or without chemotherapy and radiotherapy.

Conclusions: The burden of cancer is higher in females because of breast cancer. Reproductive organ cancers and breast cancers share an equal burden of around 20% each. The most common female genital cancer is of uterine cervix followed by the ovary.

Keywords: Breast; burden of cancer; cancer registry; cervix; ovary.

INTRODUCTION

The aging population suffers from non-communicable diseases like cancers. Its detection depends on the quality and completeness of documentation and care facilities like cancer registries.[1,2] Gender difference in cancer prevalence is skewed to males except in organ-specific cancers like breast, prostate, and genitals. Sex hormones and gender behavior may play some role in cancer susceptibility.[3]

Female genital organ cancer (uterine corpus, cervix, and ovary) incidence is second after breast, and cancer death is third after breast, colorectum, and respiratory tract.[4] The burden of gynecological cancers as well as disability-adjusted life-years are rising globally.[5]

Population-based Cancer Registry (PBCR) was started by the Nepal Health Research Council (NHRC) in 2018 to support evidence-based cancer control intervention.[6,7] The information gap in the cancer burden in the community is apparent. Thus, this study aims to identify the cancer burden in the female population, especially in the reproductive organs based on this registry.

METHODS

This is the database analysis of two years in 2018 and 2019 from the population-based cancer registry in Nepal maintained by the Nepal Health Research Council. The total registry was 6854 which includes 3590 female population. This registry covers nine out of 77 districts

Correspondence: Prof Dr Gehanath Baral PhD Scholar (Public Health), Singhania University, Email: baraldr@gmail.com; Phone: +9779841228829.

from urban, semi-urban, and rural geographical regions covering 10.75% (3,135,835 out of 29,164,578) of the total population in the country. This registry has been ongoing since January 2018 and is updated periodically.

Data were taken mainly from the community based on the documents and verbal autopsy by the trained data enumerators if documents were not available. Those having recently been diagnosed from health facilities during the study period were also taken. A quantitative database analysis of the Population based Cancer Registry (PBCR) for two years (2018 and 2019) was performed. Data entered in the TSV (Tab separated values) files were imported to MS Excel (xxls file) and SPSS window (sav file). Variable entry errors were checked, cleaned, and regrouped before analysis. Descriptive analysis was performed on the available variables.. The population from the 2021 national census, the WHO standardized population, and registry data were used for the analysis.[8,9]

Ethical approval was taken from the Ethical Review Board of NHRC.

RESULTS

Out of 6854 cancer registrations, the male-to-female ratio was 10:11. As 97% (704 out of 729) of breast cancer was shared by females out of 10.6% of total breast cancer, the proportion of female cancer registered in the system was high. By single organ cancer, of the first 15 common cancers, two-fifths were from breast, cervix, and lungs in this order. [Figure-1]

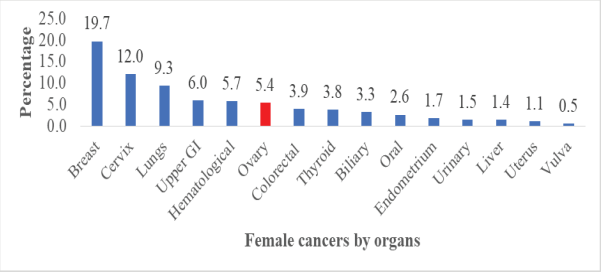

Figure-1. Common cancers in females by body organ (N=3590)

By major system involvement of cancers in females, reproductive organ cancers are the commonest followed by breast, gastrointestinal tract, lungs hepatobiliary system, and thyroid. [Figure-2]

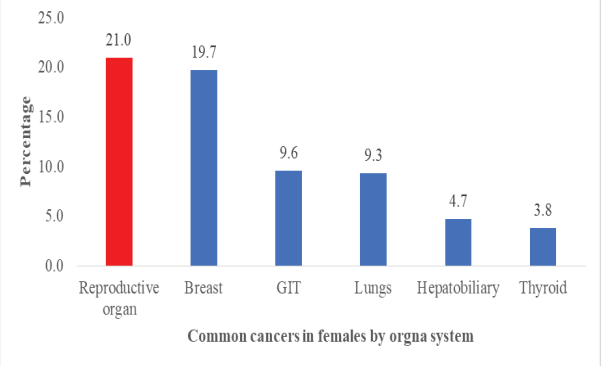

Figure 2. Female cancers by organ system (N=3590).

One-fifth of the cancer burden in females was shared by the cancer of the reproductive tract only (21%, n=753). The cervical and ovarian cancers are the first and second most common cancers in the female reproductive system by 83% together. [Figure-3]

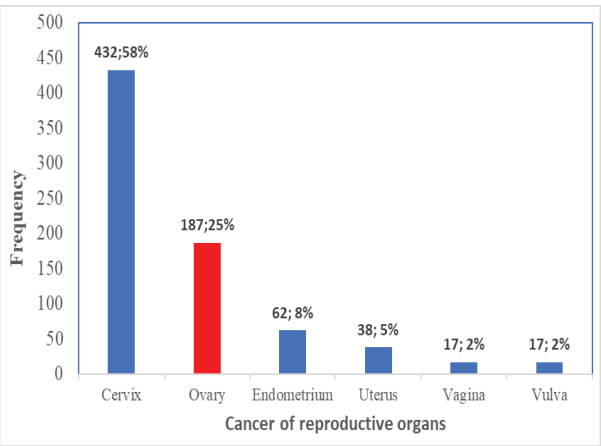

Figure 3. Reproductive tract cancers in females (N=749).

More than half (53.4%) of female cancer patients were in the active productive age group (30-60 years), and almost two-thirds of patients (64.5%) were 40-70 years. Age structure is not uniform with fewer people after 50 years of age and further less after 70 years. [Table-1]

Table-1. Age group-wise distribution of cancers in females (N=3590).

Age group in years	Age structure (%)	Frequency of cancer	Cancer by age group (%)	Cumulative frequency (%)
0-9	16.0	48	1.3	1.3
10-19	17.9	53	1.5	2.8
20-29	20.1	153	4.3	7.1
30-39	16.7	406	11.3	18.4
40-49	11.8	681	19.0	37.4
50-59	8.1	831	23.1	60.5
60-69	5.5	805	22.4	82.9
70-79	3.0	444	12.4	95.3
80-89	0.8	154	4.3	99.6
90+	0.2	15	0.4	100.0

The crude incidence rate appears more than 18 times (1.24% or 1244.4 per 100,000) higher than the WHO age-standardized incidence rate (66.2 per 100,000). It was calculated for the two-year period for the reference age structure taken from the 2021 census. Age-specific crude incidence rate is increasing as the age advances up to 90 years of age, and then declines sharply. It is 17 times more in the 80s than in the 20s. [Figure-4]

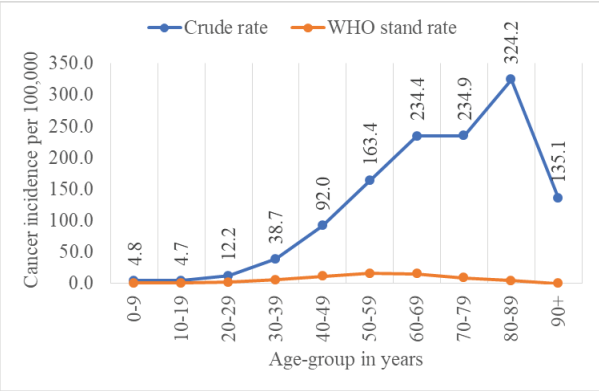

Figure4. Age-specific incidence rate per 100,000 female population. (N=3590 out of 3,135,835)

The female population under the cancer registry was almost uniformly distributed with mean, median, and mode of 53±16.4, 55, and 60 years respectively.

The ratio of documented evidences to verbal information for the cancer registry was 9:1; a majority of cancer diagnoses (78.7%) were confirmed by histo-cytology reports followed by clinical notes and records (11%). [Table-2]

Table 2. Basis of cancer registry in the community (N=3590)

Basis of diagnosis	Frequency	%
Histology of primary tumor	2139	59.6
Cytology/Peripheral blood/bone marrow	584	16.3
Verbal Information	373	10.4
Clinical Note only	200	5.6
Clinical investigation	118	3.3
Histology of metastasis	99	2.8
Death Certificate Only	53	1.5
Hospital Record	23	0.6
Specific Tumor Maker	1	0.0

Treatment received by all females of all types of cancers shows surgery followed by chemotherapy as the main treatment modality such as 41.6% had Surgery (±Chemotherapy/Radiotherapy), 22.6% had CT only, and 3.7% RT only. Surgery with adjuvant treatment and chemotherapy only constitutes 55.3% of cases but surgery only is 15%. [Figure-5]

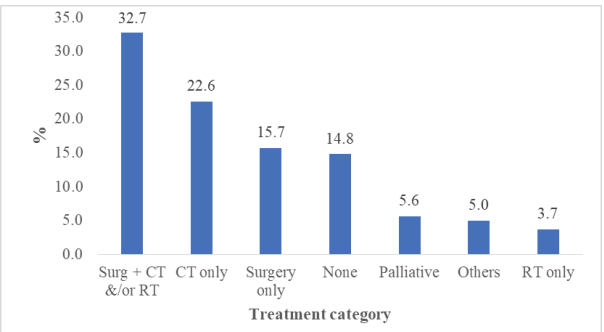

Figure5. Treatment received by proven cancer patients. (N=3590)

DISCUSSION

Cancer incidence is skewed to the female population and breast cancer is the major determinant similar to the 2020 GLOBOCAN data.[10] The current study of cancer burden in women follows the global pattern by the organ system. The commonest female reproductive organ affected by cancer is the uterine cervix (58%) followed by the ovary (25%). Similarly, these organs come on second and sixth commonest cancer in the female population by 12% and 5.4% respectively. Indian and the global pattern are also similar to the population-based database of 185 countries like third most common is cancer of the cervix (13.3%) next to the breast and lungs, and sixth is cancer of the ovary (6.6%) next to thyroid, colon, and uterus.[11,12] The epidemiology of gynecological cancer also shows its increasing trend with disability-adjusted life-years.[5] This could be because of the screening program, common clinical presentation, easy detection tests, and known risk factors in the case of cervical cancer whereas the cancer of the ovary doesn't have screening tests, the organ is not visualized externally, becomes symptomatic only in advancing stages and this is usually an incidental finding.[13] That's why, the projected mortality-to-incidence ratio of cancer of the ovary is also higher (63.6) than in the cervix (28.5).[8]

The age-specific incidence rate based on the age structure from the national census 2021 is increasing as the age advances up to 90 years of age and then declines sharply. This decline in incidence could be due to fewer people in that age group. There are high crude incidence rates even though the population in the specific age group is uniformly matching with the WHO standard population mainly in the higher age group.[9,14]

There is an increment of the average life expectancy of Nepalese people by 10 years since 2000 (0.4 years or 5 months/year). The increment is 0.5 years/year since 1950. Life expectancy is increasing linearly from 61.85 in 2000, 64.91 in 2005, 67.33 in 2010, 69.29 in 2015, 70.3 years in 2018, and now 71.97 in 2024.[15] This influences the trend of cancer burden each year due to the aging population.[16] For the females, the life expectancy at birth was 66.6 in 2000 and 72.7 in 2019 (0.3 years/year).[17]

Cancer treatment varies on geography, terrain, access, availability, affordability, and prescribing pattern.[18] Surgery with chemotherapy and chemotherapy only are the bulk of cases (>50%) in this study, indicating the diseases are in locally advanced or advanced stages. Surgery-only treatment modality observed in 15% only shows early-stage cancer. Variations in cancer characteristics, treatment options, and the optimal surgery influence cancer survival.[19] There will be more challenges to address the unmet needs to have surgical treatment in the low-resource setup.[20] At times unmet needs may be due to variations in professional attention as well.[21] Optimal supportive and survivorship care have to be assured to address the unmet need.[22]

This cancer registry is not the universal database in the country, however, it is representative of the population by geographical variable. Mortality data were not completely available to calculate the cancer survival status.

CONCLUSIONS

The burden of cancer is higher in females because of breast cancer. Reproductive organ cancers and breast cancers share an equal burden of around 20% each, and the most common female genital cancer is of the uterine cervix followed by the ovary. Age-specific cancer incidence rises 17-fold from the 20s to the 80s. Surgery and chemotherapy seem to be the mainstay of cancer treatment.

REFERENCES

1. Bray F, Parkin DM. Evaluation of data quality in the cancer registry: Principles and methods. Part I: Comparability, validity and timeliness. Eu J Cancer. 2009;45(5):747-55.doi: https://doi.org/10.1016/j.ejca.2008.11.032. [Article]

2. Parkin DM, Bray F. Evaluation of data quality in the cancer registry: Principles and methods Part II. Completeness. Eur J Cancer. 2009;45(5):756-764. https://doi.org/10.1016/j.ejca.2008.11.033 [Article]

3. Dorak MT, Karpuzoglu E. Gender differences in cancer susceptibility: an inadequately addressed issue. Front Gene. 2012;3:268. doi: 10.3389/fgene.2012.00268

4. Torre LA, Islami F, Siegel RL, Ward EM, Jemal A. Global Cancer in Women: Burden and Trends. Cancer Epidemiol Biomarkers Prev. 2017;26(4):444-457. https://doi.org/10.1158/1055-9965.EPI-16-0858

5. Kataki AC, Tiwari P, Thilagavthi R, Krishnatreya M. Epidemiology of gynaecological cancers. InFundamentals in Gynaecologic Malignancy

2023 Jan 1 (pp. 1-8). Singapore: Springer Nature Singapore.https://doi.org/10.1007/978-981-19-5860-1_1

6. Jha AK, Chapagain S, Dhimal M, Subedi R, Kafle U, Thakur C, et al. Population-based cancer registries at Kathmandu, Bhaktapur, Lalitpur, Siraha, Saptari, Dhanusha, Mohattari, West Rukum and East Rukum districts, Nepal-2018. Nepal Health Research Council; 2018[Download PDF]

7. World Health Organization. Global strategy to accelerate the elimination of cervical cancer as a public health problem. Geneva: World Health Organization. 2020; Licence: CC BY-NC-SA 3.0 IGO

8. National Statistics Office. Government of Nepal. National Population and Housing Census 2021. URL: https://censusnepal.cbs.gov.np/results/population#population_size_and_distribution

9. Miranda-Filho A, Bray F, Charvat H, Rajaraman S, Soerjomataram I. The World Cancer Patient Population (WCPP): An updated standard for international comparisons of population-based survival. Cancer Epidemiol. 2020;*69*. https://doi.org/10.1016/j.canep.2020.101802

10. Sung H, Ferlay J, Siegel RL, Laversanne M, Soerjomataram I, Jemal A, et al. Global cancer statistics 2020: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. CA Cancer J Clin. 2021;71(3):209-49. doi: 10.3322/caac.21660.

11. Report of National Cancer Registry Programme (ICMR-NCDIR), Bengaluru, India; 2020. https://www.ncdirindia.org/All_Reports/Report_2020/default.aspx.

12. Bizuayehu HM, Dadi AF, Hassen TA, Ketema DB, Ahmed KY, Kassa ZY, et al. Global burden of 34 cancers among women in 2020 and projections to 2040: Population-based data from 185 countries/territories. Int J Cancer. 2023;1-17. doi:10.1002/ijc.34809

13. Momenimovahed Z, Tiznobaik A, Taheri S, Salehiniya H. Ovarian cancer in the world: epidemiology and risk factors. Int J Women's Health. 2019;11:287-99. https://doi.org/10.2147/IJWH.S197604

14. Ahmad OB, Boschi-Pinto C, Lopez AD, Murray CJL, Lonazo R, Inoue M. Age Standardization of Rates: A New WHO Standard. 2000; GPE Discussion Paper Series: No 31, World Health.

15. Nepal Life Expectancy 1950-2024. URL: https://www.macrotrends.net/countries/NPL/nepal/life-expectancy. Retrieved 2024-01-28.

16. Jordan SJ, Webb PM. Gynecological Cancers In: A life course approach to women's health. 2nd ed. Editors: Mishra GD, Hardy R, Kuh D. Oxford University Press 2023. DOI: 10.1093/oso/9780192864642.003.0012

17. World Health Organization. Life expectancy at birth (years). 2023. https://data.who.int/indicators/i/90E2E48 (Accessed on 28 January 2024)

18. Chamberlain C, Owen-Smith A, Donovan J, Hollingworth W. A systematic review of geographical variation in access to chemotherapy. BMC cancer. 2016;16:1-5. DOI 10.1186/s12885-015-2026-y

19. Dehaeck U, McGahan CE, Santos JL, Carey MS, Swenerton KD, Kwon JS. The impact of geographic variations in treatment on outcomes in ovarian cancer. Int J Gynecol Cancer. 2013;23(2). https://doi.org/10.1097/IGC.0b013e31827b87b1

20. Gyorki DE, Muyco A, Kushner AL, Brennan MF, Kingham TP. Cancer Surgery in Low-Income Countries: An Unmet Need. Arch Surg. 2012;147(12):1135-40. doi:10.1001/archsurg.2012.1265

21. Effendy C, Vissers K, Osse BHP, Tejawinata S, Vernooij-Dassen M, Engels Y. Comparison of Problems and Unmet Needs of Patients with Advanced Cancer in a European Country and an Asian Country. Pain Pract. 2015;15:433-40. https://doi.org/10.1111/papr.12196

22. Molassiotis A, Yates P, Li Q, So WKW, Pongthavornkamol K, Pittayapan P, et al. Mapping unmet supportive care needs, quality-of-life perceptions and current symptoms in cancer survivors across the Asia-Pacific region: results from the International STEP Study. Annals Oncol. 2017;28(10):2552-8. https://doi.org/10.1093/annonc/mdx350.