

A Systematic Review on the Incidence of Cervical Cancer in Zambia

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Abstract: Cervical cancer is one of the most common causes of cancer related deaths in the world especially in developing countries, its ranked the 2nd common cause of cancer in women. Latin America, sub-Saharan African, south and South East Asia has the highest incident rate of cervical cancer of about 15% of cancer globally. Zambia is ranked second with Incidence Rate of (53.7/100,000 women) in sub-Saharan Africa.

To determine the incidence of cervical cancer in Zambia, assess the risk factors of cervical cancer and find out the preventive measures available. The systematic review followed the checklist guidelines of PRIAMA and this review is based on scientific articles, Peer-reviewed journals on cervical cancer from databases like Pub med and Google scholar.

Out of 5050 studies containing the key words, 10 articles selected was for this review. The studies concluded that Zambia has the highest incidence of cervical cancer. Among the risk factors of cervical cancer were human immunodeficiency virus (HIV) and human papilloma virus (HPV) as well as other co-factors. Screening was the test used to reduce the incidence of cervical cancer through visual inspection with acetic acid (VIA) and loop electrosurgical excision procedure (LEEP).

Zambia is among the developing countries with the highest incidence of cervical cancer in sub-Saharan Africa. Digital cervicography-based cervical cancer screening programs are now effective and scalable in resources-constrained settings like Zambia and saves as a platform for the introduction of other critical and urgent women's cancer and prevention as well as treatment initiatives

Keywords: Cervical cancer, incidence rate, risk factors, screening test, prevention, Zambia.

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I. Introduction

Cervical cancer is one of the most common causes of cancer related deaths in the world especially in developing countries and it is ranked the 2nd common cause of cancer in women. Latin America, sub-Saharan African, south and South East Asia has the highest incident rate of cervical cancer of about 15% of cancer globally. Zambia is ranked second with incidence Rate of (53.7/100,000 women) in sub-Saharan Africa [1][2].

Cervical cancer claims about 87% of deaths in the developing countries and a quarter million of women annually worldwide. Over 528,000 women annually worldwide diagnosed with cervical cancer of which 80% of these new cases occur in the developing countries [2]. The reason for these high rates is not that HPV infection is high in particular areas but that preventive strategies and treatment not carried out well enough in developing countries. In resource-limited countries like Zambia, there is shortage and limited specialised skilled health workers, lack of political will and insufficient funds towards women's health activities, which contribute to these high rates [8]. One of the most risk factor for cervical cancer is HIV, Zambia is among the countries in sub-Saharan Africa with the highest rates of HIV at 15.6% of which the prevalence stands at 17% [3].

As reported by several articles from the global distribution of cervical cancer, it is primarily a disease of the poor and disadvantaged population. Pap smear was the screening test for a long time in Zambia to treat cancer but because of limited resources and poor laboratory infrastructures, this screening test failed to succeed. Since then alternative methods of screening recommended visual inspection with acetic acid (VIA) which has been suitable and now used as a screening test for cervical cancer. The Zambia Cervical Cancer Control Program started in 2006 with the support of the President's Emergency Plan for AIDS Relief (PEPFAR) funds to reduce the incidence of cervical cancer. Digital cervicography-based cervical cancer screening programs are now effective and scalable in resources-constrained settings like Zambia and saves as a platform for the introduction of other critical and urgent women's cancer and prevention as well as treatment initiatives [3] [4].

As of December 2016, 277,887 Zambian women received cervical cancer screening and free Cervical Cancer Screening Clinics are located in every Zambian Province. Until date, there are 49 screening and treatment sites for cervical pre-cancer and 24 loop electrosurgical excision procedure (LEEP) treatment sites in all ten provinces with more sites opening. Training of government health workers in cervical cancer screening and treatment is ongoing and over 300 health workers now trainin cervical cancer screening and data management. Training has been provided by regional health workers from Kenya, Zimbabwe, Botswana, Tanzania, Uganda, Mozambique, Nigeria, Cameroon, Namibia, DRC, Swaziland, Lesotho and South Africa [3][6].

II. Method

Database and information strategy

This systematic review followed the checklist guidelines of PRISMA [10]. The research strategy is on literature review of policy documents, scientific articles and secondary data from the cervical cancer control program in Zambia, Peer-reviewed journals, focus group discussions and systematic reviews on cervical cancer. The search conducted was within one month in August 2018. Zambia has an estimated population of 17,470,471 as of 1st January 2018, having 10 different provinces. The report indicated a sample size of women between the age of 21 and 55. Data collection was from literature review using search engine like Google, Google scholar, pub med, World Health Organisation (WHO) and International Agency for Research in Cancer (IARC), Ministry of Health Zambia (MOH), National Aids Council of Zambia (NACZ) and Alliance for Cervical Cancer prevention (ACCP). No approval was required from the ethics committee as the information used was secondary data from already published literatures reviews and articles.

Study selection

According to the best practice for review of literature, the experts determined criterial for eligibility as earlier mentioned. Their results were compared and along the line agreed and disagreed to some factors and came to conclusion on the terms after a consensus was reached. At first, the search done was for the title, abstracts and was screened based on eligibility factors and the inclusion criterial. Similar exercise achieved was for the full text study after the inclusion criterial.

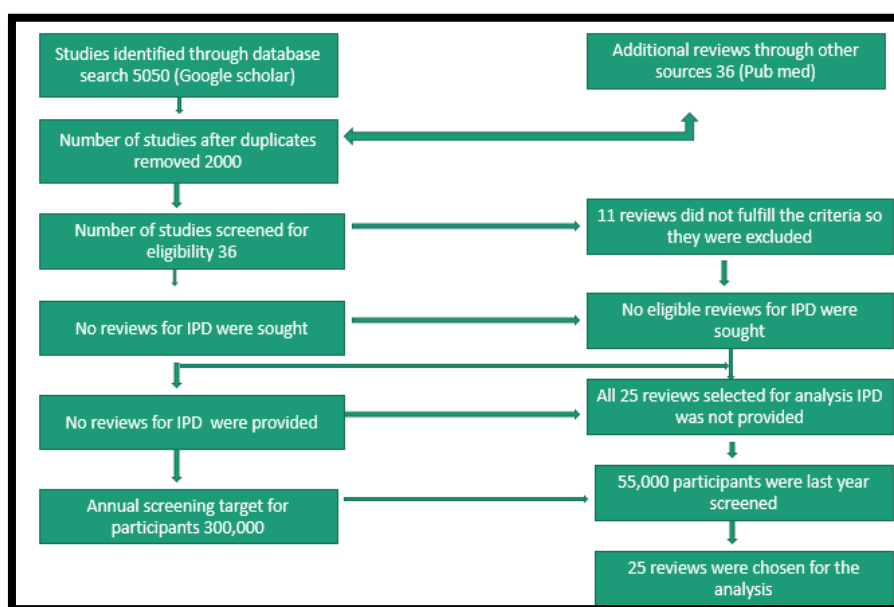


Figure 1: PRISMA, study selection diagram

The inclusion criterion was to assess the risk factors and preventive measures through evaluation of documents and reviews on the aspects of incidence related to cervical cancer in Zambia. The initial search yielded 5050 papers containing the specific key words. From these studies, 36 selected was for the full reading of the text. The remaining 5024 did not fulfil the inclusion criteria and among the 36, about 10 was selected for this review, leaving 26 to be excluded as they did not meet the inclusion criterial. Therefore, a recent systematic review included that the human papilloma virus (HPV) is one of a necessary cause for cervical cancer but not really a sufficient cause, although there are other co-factors necessary for progression of HPV infection to cervical cancer.

The established co-factors are high parity of long-term hormonal contraceptive use, co-infection with HIV and smoking. Co-infection with Chlamydia and herpes simplex virus type-2, certain dietary deficiencies and immunosuppressant are probable factors as well as genetic and immunological factors together with viral factors can lead to cervical cancer. However, the study reports indicating the human papilloma virus (HPV) progressions to cervical cancer and other co-factors excluded from the review. The objective was to determine the incidence of cervical cancer in Zambia, assess the risk factors of cervical cancer and find out the preventive measures available.

III. Result

Table 1: Descriptive explanation of studies included in study

Authors name	Topic	Objective	Methodology	Results	Conclusion
Rose et al	The sub-Saharan Africa perspective	Appraise the incidence, mortality, knowledge, prevention and treatment of cervical cancer	A computerized literature search was conducted for published articles.	Increased Incidence Rate	Knowledge and awareness of this disease on the continent are very poor and mortality still very high
Bowa k et al	Review of the Epidemiology Of cancer at UTH	Determine the incidence of cancer of the cervix	Retrospective study based on pathology reports at UTH laboratory	Increase of cancer of the cervix	There has been significance change for malignancies over the last 20 years
Mwanahamuntu MH et al	Advancing cervical cancer prevention initiatives	Gain insights from the cervical cancer prevention program in Zambia	Cross-sectional study from the cervical cancer prevention program	Invasive cervical cancer is a leading cause of cancer-related death and morbidity among women in the developing world	Screening coverage rates are very low in developing countries despite there being proven, simple, "screen and treat" approaches for cervical cancer prevention
Ng'andwe et al	Distribution of sexually transmitted human papilloma virus in HIV positive & negative patients in Zambia.	Assess HPV prevalence, genotype distribution and to identify co-factors that influence HPV infection.	Retrospective cross-sectional study reports findings on the association and effects of HIV on HPV infections in an existing cohort of patients at University Teaching Hospital (UTH) Lusaka, Zambia.	Discovered that HIV positive patients were two-times as likely to have an HR HPV as HIV negative individuals, while the distribution of LR HPVs was unaffected by HIV status.	The rate of oncogenic HPVs (type 16 and 18) in Zambia was much higher than in the U.S., potentially providing an explanation for the high-rates of cervical cancer in Zambia.
Sahasrabuddhe vv et al	Prevalence and distribution of HPV genotypes among infected women in Zambia	Determine the prevalence and distribution of cervical cancer among HIV infected women	Screened 145 HIV-infected non-pregnant women at a tertiary care centre in Lusaka, Zambia. Liquid-based cytology and human papillomavirus (HPV) genotyping with PGMY09/11 biotinylated primers (Roche Linear Array® HPV genotyping test) maximised sensitivity of cytology and HPV assessments.	Among high-risk (HR) types, HPV 52 (37.2%), 58 (24.1%) and 53 (20.7%) were more common overall than HPV 16 (17.2%) and 18 (13.1%) in women with high-grade squamous intraepithelial lesions or squamous cell carcinoma (SCC) on cytology.	Human papillomavirus diversity in high-grade lesions and SCC on cytology suggests that HPV 16- and 18-based vaccines may not be adequately polyvalent to induce protective immunity in this population.

Atara Ntekim	Cervical cancer in Sub Sahara Africa	Aim of this work is to appraise the incidence, mortality, state of prevention and treatment of cervical cancer in sub-Saharan Africa	The method used was through the synthesis of data and information derived from available current published scientific works from peer reviewed journals, workshop proceedings	Cervical cancer occurs worldwide but the highest incidence and mortality rates of cervical cancer are in Eastern, Western, and Southern Africa, as well as South-Central Asia and South America	Cervical cancer is still a problem in sub Sahara Africa. Concerted and focused effort towards the reduction in the burden of the disease is urgently needed
Mwanahamuntu M H et al	Utilization of Cervical Cancer Screening Services and Trends in Screening Positivity Rates in a 'Screen-And-Treat' Program Integrated with HIV/AIDS Care in Zambia	Assess the positivity of the screening-and – treat programs integrated with HIV/AIDS in Zambia	Analyzed program operations data from the Cervical Cancer Prevention Program in Zambia (CCPPZ), the largest public sector programs of its kind in sub-Saharan Africa. Evaluated patterns of utilization of screening services by HIV serostatus, examined contemporaneous trends in screening outcomes, and used multivariable modeling to identify factors associated with screening test positivity.	Between January 2006 and April 2011, CCPPZ services were utilized by 56,247 women who underwent cervical cancer screening with visual inspection with acetic acid (VIA).	This is the first 'real world' demonstration in a public sector implementation program in a sub-Saharan African setting that with successful program scale-up efforts, nurse-led cervical cancer screening programs targeting women with HIV can expand and serve all women, regardless of HIV serostatus.
Ferrinho et al	Human resource for health situation in Zambia	Assess the dimension of shortages and of imbalances in the distribution of health workers by province and by level of care.	Secondary data from the "March 2008 payroll data base", which lists all the public servants on the payroll of the Ministry of Health and of the National Health Service facilities. Computed rates and ratios then compared them	Observed significant shortages in most staff categories, except for support staff, which had a significant surplus.	This case show a politically stable country with a longstanding tradition of strategic management of the health sector and with a track record of innovative approaches dealt with its HRH problems, but still has a major absolute and relative shortage of health workers.
Kalima et al	Observed and Expected Incidence of Cervical Cancer in Lusaka and the Southern and Western Provinces of Zambia, 2007 - 2012	Estimate cervical cancer incidence	Data for 2007-2012 was obtained for the 3 provinces. Data included age, residence, year of diagnosis, marital status, occupation, HIV, stage, radiotherapy and chemotherapy.	Crude and age-standardized incidence rates (ASR) in Lusaka were 2-4 times higher than incidence in the other 2 provinces.	Cervical cancer is significantly underestimated in Zambia and HIV has a significant role in pathogenesis. Future studies should establish methods for case ascertainment and better utilization of hospital- and population-based registries in Zambia and other similar developing countries.

The study concluded that Zambia has the highest incidence rate of cervical cancer cases, ranked second with incidence Rate of (53.7/100,000 women) in sub-Saharan Africa.

Among the risk factors for cervical cancer found was HIV and Zambia is among the countries in sub-Saharan Africa with the highest rates of HIV at 15.6% of which the prevalence stands at 17%. Other factors that could lead to cervical cancer that were included was human papilloma virus (HPV) as a necessary cause for cervical cancer, but not really a sufficient cause and other co-factors that could progress from human papilloma virus (HPV) infection to cervical cancer. The established co-factors are high parity of long term hormonal contraceptive use, co-infection with HIV and smoking. Co-infection with Chlamydia and herpes simplex virus

type-2, certain dietary deficiencies and immunosuppressant are probable factors as well as genetic and immunological factors together with viral factors can lead to cervical cancer [4].

The review showed that screening has been used and known as a preventive measure to reduce the incidence and mortality rates of cervical cancer in developing countries like Zambia and other developed countries. Visual inspection with acetic acid (VIA) is a screening test used and loop electrosurgical excision procedure (LEEP) is used for the treatment of cervical cancer in Zambia [3][4].

IV. Discussion

The study on the incidence of cervical cancer in Zambia according to this systematic review, points out that Zambia has the highest incidence rate of cervical cancer. Pap smear (Pap test) been used as the screening test for a long time in Zambia to treat cancer but because of limited resources and poor laboratory infrastructures, this screening test failed to succeed. Alternative methods of screening recommended was visual inspection with acetic acid (VIA) which is now used as a screening test for cervical cancer. Digital cervicography-based cervical cancer screening programs are now effective and scalable in resources-constrained settings like Zambia and saves as a platform for the introduction of other critical and urgent women's cancer and prevention as well as treatment initiatives. Reports showed that about 55,000 women last year screened for cervical cancer, which is far below the almost 300,000 annual targets. Cervical cancer is the most common cancer in Zambia and accounts for over 30 percent of new cases, hence the need for women to go for screening is important because there is need to ascertain what treatment those affected could undergo [7] [8].

Early diagnosis is important so that something can be done before it develops into cancer, the country has over 60 centres that are screening for cervical cancer and that the 300,000 target can be reached if women turned up in numbers for screening. Although in most centres, cervical cancer screening has been very low with some centres screening as low as fifteen women do in a month. Government is yet to open 30 new cervical cancer centres and will by 2021 so that there will be screening centre in each district to try reach as many women as possible "[9].

Ultimately Zambia shows an increased incidence rate of cervical cancer over the last few years with slightly increase in population. The gap in this systematic review is that, it shows the increase in the incidence of cervical cancer in Zambia but it does not state the reasons, which have led to the high increase of cervical cancer cases in the country.

V. Conclusion

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