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The Risks of Sexual and Reproductive Activity on the Occurrence of Cervical Cancer in Central Sulawesi Province: Case Study of patients of Undata Hospital

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Abstract

This study aimed to determine the risk of age at first having sexual intercourse, parity, use of hormonal contraception, and exposure to cigarette smoke for the incidence of cervical cancer in Undata Hospital. This type of research was a quantitative method with a case-control approach. Case samples were 48 people, and control samples were 48 people with matching ages. Sampling was done by purposive sampling. The data source used secondary data from medical record records for 2021-2022 and primary data obtained through interviews with questionnaires. Data analysis used the odds ratio test, and the results showed that age at first sexual intercourse (OR= 2.333; CI = 1.029-5.292), parity (OR= 4.000; CI = 1.712-9.346), use of hormonal contraception (OR= 2.600; CI = 1.130-5.984), and exposure to cigarette smoke (OR= 1.486; CI = 0.539-4.100), are risk factors for cervical cancer. To overcome the incidence of cervical cancer, women of childbearing age and sexually active are expected to be routinely screened by doing pap HPV smear and vaccination.

Keywords: Age of First Sexual Activity, Parity, Use of Hormonal Contraceptives, Exposure to Cigarette Smoke, Cervical Cancer

Key Messages:

- The parity variable is the variable that has the greatest risk of developing cervical cancer at the Undata Regional General Hospital, Central Sulawesi Province

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1. Introduction

Cancer is a non-communicable disease (NCD) and is the second leading cause of death in the world after cardiovascular disease. Cervical cancer is one of the most common and common gynecological cancers in women today. The development of this disease begins with cervical epithelial metaplasia in the Squamous Columnar Junction (SJC), which is the transition of the vaginal mucosa and cervical canal mucosa. Cervical cancer always begins as a precancerous lesion that, over the years, can develop into an invasive (malignant). As with cancer in

general, cervical cancer will cause many problems: pain, suffering, and financial and environmental problems (1). The main cause of cervical cancer is infection with 95% Human Papilloma Virus (HPV), especially types 16 and 18 (2).

Cervical cancer is one of the most preventable cancers. However, in 2020, an estimated 341,800 women will die from cervical cancer globally. The new cases of cervical cancer annually are projected to increase from 570,000 to 700,000 between 2018 and 2030, with the annual deaths projected to increase from 311,000 to 400,0002. Most of these deaths occur in low and lower-middle-income countries (LMICs) due to inadequate access to cervical cancer prevention, screening, and treatment (3). The incidence of cervical cancer reaches 15 per 100,000 population observed in developing countries, such as eastern Africa (42.7%), Melanesia (33.3%), southern Africa (31.5%), central Africa (30, 6%) and lowest risk level in Australia and New Zealand (5.5%) and West Asia (4.4%) (4). Cervical cancer ranks highest in developing countries, tenth in developed countries, or fifth globally. Cervical cancer ranks first with a prevalence of 18.62% of the ten most common cancers found in 13 anatomical pathology laboratory centers. Indonesia is the country with the largest number of people living with cervical cancer in the world (5), and currently, cervical cancer is the second highest cancer disease with a prevalence of 0.8% in 2018 and 17.2% in 2020 after breast cancer (6); (7).

Cervical cancer is a preventable disease with early detection and HPV vaccination. Research for cervical cancer screening and HPV vaccination has been carried out in countries for the last few decades, but national coverage is still low (3). Based on data from the Recapitulation of Early Detection of Cervical Cancer (IVA) from the Central Sulawesi Provincial Health Office, the number of people with cervical cancer in 2020 was 108 cases with a total of 13 cervical cancer deaths, women of childbearing age who only carried out Acetic Acid Visual Inspection of 0.45%. Whereas in 2021, there were 75 cases with 10 deaths, while women in childbearing age who carried out an IVA inspection was 0.47%, not much different from the previous year (8). The target figure for IVA coverage has not yet reached the national target; in Regulation of the Minister of Health of the Republic of Indonesia Number 34 of 2015 concerning the Management of Breast Cancer and Cervical Cancer, the target is planned for 2019 it is hoped that 80% of community health center (Puskesmas) in Indonesia will be able to carry out IVA in stages. However, until now, this target has not been achieved (9).

Based on the Preliminary Study conducted by Undata General Hospital of Central Sulawesi Province, which is the Highest Hospital as a place for Medical Referrals from various regions to refer patients who have malignancy or complications in 13 districts/cities of Central Sulawesi Province, cervical cancer is one of the three most significant diseases in Indonesia. Gynecological Oncology Polyclinic at Undata Hospital, Central Sulawesi Province, in 2021 after breast and ovarian cancers. The number of new cases of cervical cancer at Undata Hospital in 2020 was 312 cases, increasing in 2021 to 322 cases. Based on the calculation of new cases and cervical cancer deaths, the CFR (Case Fatality Rate) in 2020 was 0.03%, and in 2021 it was 0.046% (10).

In general, the factors that cause cervical cancer are caused by an unhealthy lifestyle, a bad lifestyle in daily life, and the wrong way to treat the reproductive organs. Therefore, this disease knows no age. In addition to the factors above, other factors are at risk of causing cervical cancer, including socio-demographic factors (age, socio-economic status) and sexual activity factors (age at first sexual intercourse, multiple sexual partners, parity, lack of genital hygiene care, smoking, obesity, history of venereal disease, family history of cervical cancer, chronic cervical trauma, use of pads and pantyliners, diethylstilbestrol (DES), and use of oral contraceptives). Some factors can be modified and cannot be modified (6). Thus, this study aimed to determine the risk of age at first having sexual intercourse, parity, use of hormonal contraception, and exposure to cigarette smoke for the incidence of cervical cancer in Undata Hospital, Central Sulawesi.

2. Methods

This research was a quantitative study using a case-control research design. This research was conducted at the Undata Regional General Hospital (in Indonesia: RSUD), Central Sulawesi Province, the Highest Hospital for Medical Referrals from various regions to refer patients with malignant diseases or complications in 13 districts/cities of Central Sulawesi Province. This research was conducted from 28 April to 2 June 2022, involving the population of all patients recorded in the medical records at Undata Hospital as Gynecological Oncology patients. The case sample was cervical cancer at the Gynecological Oncology Poly based on the 2020-2021 Obgyn doctor's diagnosis results. Meanwhile, the control sample consisted of patients who came to the Undata Regional

General Hospital and checked themselves into the gynecological oncology polyclinic with diagnoses of menstrual disorders, bleeding, and cervical tumors. The number of cases and controls amounted to 48 people or 1:1. The research variables are the characteristics of the respondents (including: age, Occupation, Education, Cigarette Smoke Exposure), the risk of age at first having sexual intercourse (divided into 4 age groups with a range of 15-30 years), parity (4-6 Times Giving Birth, 1 -3 Times Giving Birth), use of hormonal contraception (5-6 years, 1-4 years), Types of Contraception (Combination Pill, 1 Month injection, 3 Months Injection, Implant, IUDs/Spirals), and incidence of cervical cancer. Each variable was collected using a questionnaire. Data were analyzed using univariate and bivariate analysis using the chi-square test by looking at the OR (Odd Ratio) value to determine the risk of each variable studied.

3. Results

Table 1 shows that according to the age group, the highest number of respondents was the age group 46-50 years with 30 respondents (31.2%) and the lowest respondent age group was the age group 61-65 years with 4 respondents (4.2%). The highest of respondents' occupations were Housewive, about 69 respondents (71.9%), and the lowest was civil servants, about 2 respondents (2.1%). Based on education level, the highest respondent with last education was Elementary and Junior High School, with about 32 respondents (33.3%) each, and the lowest respondent's education level was associate degree-Diploma/Bachelor degree, with about 11 respondents (11.5%). Most of the respondents were more exposed to cigarette smoke, as many as 77 respondents (80.2%).

Table 1. Distribution of Respondents Based on Respondent Characteristics

Respondent Characteristics	N	%
Age (y.o)		
36-40	15	15.6
41-45	24	25.0
46-50	30	31.2
51-55	18	18.8
56-60	5	5.2
61-65	4	4.2
Occupation		
Housewife	69	71.9
Trader	12	12.5
Self-employed	9	9.4
Private employees	4	4.2
civil servant	2	2.1
Education		
Elementary School	32	33.3
Junior High School	32	33.3
Senior High School	21	21.9
Diploma/Bachelor Degree	11	11.5
Cigarette Smoke Exposure		
Yes	77	80.2
No	19	19.8
Total	96	100

Source: Primary Data, 2022

This study looked at the sexual and reproductive activities of the respondents, namely the age at which the respondent first had sexual intercourse, the number of parities, and the use of hormonal contraception. Based on Table 2. The respondents in this study had the most sexual intercourse for the first time at the age of 19-22 years, about 34 respondents (35.4%) and the lowest was having sex at the age of 27-30 years, about 5 respondents (5.2%). Respondents who gave birth 4-6 times and 1-3 times gave birth to children had the same frequency and percentage, about 48 respondents (50.0%) each. Most respondents used combination pill type contraception, as many as 48 respondents (50%), with 57% of respondents using hormonal contraception for 5-6 years.

Table 2. Distribution of Respondents Based on Sexual and Reproductive Activities

Sexual Activity and Reproduction	n	%
Age at first sexual intercourse (Years Old)		
15-18	33	34.4
19-22	34	35.4
23-26	24	25.0
27-30	5	5.2
Parity		
4-6 Times Giving Birth	48	50.0
1-3 Times Giving Birth	48	50.0
Use of Hormonal Contraception		
5-6 years	55	57.3
1-4 years	41	42.7
Types of Contraception		
Combination Pill	48	50.0
1 Month injection	7	7.3
3 Months Injection	26	27.1
Implant	8	8.3
IUDs/Spirals	7	7.3
Total	96	100

Source: Primary Data, 2022

Based on the bivariate analysis in Table 3, statistical tests obtained the Odds Ratio (OR) value of 2.333 at the 95% Confidence Interval (CI) of 1.029 - 5.292. It means that the risk of women with the age of first sexual intercourse <20 years (high risk) would experience cervical cancer was 2.3 times greater than women with the age of first sexual intercourse ≥20 years (low risk) because OR > 1. Then, the age at first sexual intercourse is a risk factor for cervical cancer. The Odds Ratio (OR) value was 4.000 at a 95% Confidence Interval (CI) of 1.712-9.346 for parity, meaning that the risk of women with parity >3 (high risk) experiencing cancer. The Odds Ratio (OR) value of 2.600 at the 95% Confidence Interval (CI) of 1.130-5.984 for Use of Hormonal Contraception. It means that the risk of women using hormonal contraception >4 years (high risk) of experiencing cervical cancer was 2,600 times greater than women using hormonal contraception ≤4 years (low risk). Then, since OR > 1, hormonal contraception is a risk factor for cervical cancer.

Table 3. Risk of Age of First Sexual Relations against Cervical Cancer

Variable	Cervical Cancer Incidence				Total		OR (CI 95%)
	Cases		Control				
	n	%	n	%	n	%	
Age of First Sexual Relations							
High Risk	30	62.5	20	41.7	50	52.1	2.333 (1.029-
Low Risk	18	37.5	28	58.3	46	47.9	5.292)
Parity							
High Risk	32	66.7	16	33.3	48	50.0	4.000 (1.712-
Low Risk	16	33.3	32	66.7	48	50.0	9.346)
Use of Hormonal Contraception							
High Risk	33	68.8	22	45.8	55	57.3	2.600
Low Risk	15	31.2	26	54.2	41	42.7	(1.130-5.984)
Total	48	100	48	100	96	100	

4. Discussion

Based on the results of this study, it was identified that age at first sexual intercourse, parity, and use of hormonal contraception were risk factors for cervical cancer. In this study, it was found that women who had a history of having sexual intercourse for the first time under the age of 20 years were at risk 2.3 times greater for suffering from cervical cancer than women who had sexual intercourse for the first time ≥20 years (OR = 2.333; CI95% = 1.029 – 5.292). This study identified as many as 30 respondents having sexual intercourse under the age of 20 (Table 2); this result is also in line with the research conducted Aziyah (2017) (2) that those who had sexual intercourse at the age of the first time <20 years had six times the risk of experiencing cervical cancer. Another study was conducted to assess risk factors for cervical cancer in patients visiting the Outpatient Gynecology Department at the Post Graduate Institute of Medical Education and Research - Chandigarh found that early marriage age was also positively associated with cervical cancer (11). A study in Nineveh Governorate looked at pap smear results in female patients aged 11-76 y.o, and found that age at first marriage and length of marriage was closely related to an abnormal cervix on pap smear results, where the average age of first marriage married is 18.9 years (12).

The age at first having sexual intercourse coincided with marriage because usually, a person will have sexual intercourse if they are already in a marital bond, as was the case in this study. Women who have been sexually active before age 20 have an increased risk of developing cervical cancer. Sexual intercourse should ideally be carried out after a woman is entirely mature, where maturity also depends on the mucous cells found in the skin lining inside the body cavity. Sexual intercourse that is too early affects the damage to the walls of the vaginal cavity (13). The risk of suffering from cervical cancer increases if the marriage is young or the first time coitus is at the age of 15-20 years or in the teens and the latency period between the first time of coitus until cervical cancer is detected for 30 years (14). If a woman has sexual intercourse for the first time under the age of 20, the stimulation given to cervical cancer, which is still susceptible, can risk causing precancerous lesions, which can cause the cancer-causing virus to enter. Generally, new mucosal cells mature after women are 20 years old and above, not seen from a woman's menstruation. The cervix in adolescents is more susceptible to carcinogenic stimuli because there is an active process of squamous metaplasia which can cause cervical cancer. It means that the reproductive organs of adolescents are vulnerable to stimulation. So, those under 20 y.o are not ready to receive external stimulation. Women who have sex before the age of 18 years old will be at risk of developing cervical cancer because the age at first intercourse and the number of sexual partners are very strong risk factors for cervical cancer. Cervical columnar cells in women under 20 years of age are more sensitive to metaplastic changes; these cells have a 5 times greater risk of developing cervical cancer (15). However, the results of this study are not in line with the research Phaiphichit J (2022) that the age at first marriage was not significantly associated with the incidence of cervical cancer in women 25-60 years in Laos (16).

Based on the results of this study, 66.7% of patients with cervical cancer had more than 3 times the number of live births (Table 2). The analysis showed that respondents with more than 3 pregnancies had a 4 times greater risk of suffering from cervical cancer than those with less than or equal to 3 pregnancies (OR = 4,000; CI 95% 1.712-9.346). Based on research Ashar H et al (2020) (17), the results of multivariate analysis showed that mothers with high parity (> 4 children) and having more than one sexual partner had the highest risk of precancerous lesions of 16.5 times. A study with a meta-analysis was also conducted to see the relationship between parity and cervical cancer, and the results showed that women with high parity had a 2.65 times higher chance of developing cervical cancer compared to the control group (OR=2.65, CI 95% 2.08–3.38) (18). The results of a similar study, which was also conducted in Indonesia, found that the parities contribute to the incidence of cervical cancer in West Kalimantan (19).

This study identified among 48 mothers who had cervical cancer, there were 16 respondents (33.3%) who had a history of low-risk parity. This shows that the incidence of cervical cancer is not only caused by parity but by several factors, such as the spacing of pregnancies that are too close so that the ability of the cervix to maintain the transformation zone against Human Papilloma Virus (HPV) infection decreases. Parity can also be influenced by several factors, one of which is the level of education. In this study, almost half (43.8%) of the respondents had secondary education (Senior High School). A low level of mothers' education results in a lack of knowledge of mothers facing problems, while mothers with a higher education level are generally open to accepting changes or new things to maintain health. According to the researcher's assumption, parity also does not influence the

occurrence of cervical cancer where several respondents experience cervical cancer in parity ≤3 Times giving birth. This happens due to poor personal hygiene before and after sexual intercourse, which does not clean the genitals; it is expected to facilitate infection, in addition to an unhealthy sexual life or having sexual intercourse during menstruation, this makes it easier to be infected with the Human Papilloma Virus (HPV). Preventive measures for the risk of cervical cancer in women of childbearing age are recommended to use of barrier contraception (condoms, diaphragms, and spermicides) to limit the number of children and to regulate the spacing of births to reduce the risk of cervical cancer so as not to cause trauma to the cervix which can then become a factor in the emergence of cervical cancer of Papilloma Virus (HPV).

The risk of using hormonal contraception on the incidence of cervical cancer (in Table 3) was seen in this study, and it was found that 33 respondents used hormonal contraception for more than 4 years. The analysis showed that respondents who used hormonal contraception for >4 years had a 2.6 times greater risk of developing cervical cancer than respondents who used hormonal contraception for ≤4 years (OR=2.600; CI 95% 1.130-5.984). This study's results align with the results of Putri, Siti Khaerunnisa, and Indra's (2019) research that a history of taking birth control pills for more than 10 years is a factor associated with the incidence of cervical cancer. Similar research was also conducted by (20), found an association between the duration of hormonal contraceptive use and cervical cancer; this strong association was indicated by an odds ratio (OR) of 4.2. While studies by (21) identified a correlation between the use of hormonal contraception and contraception, in this study, a comparison between women who had used any hormonal contraception and those who had never used contraception found that those who had used hormonal contraception had a relative risk (RR) of 1.19 (95% confidence interval [CI] 1.10-1.29). This study suggests that the pattern of risk among all users of hormonal and combined contraceptives generally increases with a longer duration of use and decreases after discontinuation, possibly taking longer to eliminate the risk among prolonged users. Combination contraceptives containing different progestins carry similar risks. About one additional cervical cancer occurs for every 14,700 women who use combined contraceptives for 1 year.

In this study, the type of contraception used by respondents 47.9%, changed their contraception from 3-month injections to combination pills. Changing the type of hormonal contraception for birth control pills was too close, so the respondent was not aware of the consequences of using hormonal contraception and the side effects of using the combination pill type of contraceptive that the respondent was using. Biologically, the mechanism that can explain the relationship between hormonal contraception and cervical cancer is that hormonal contraception functions as a tool to control the growth of neoplasms. Furthermore, the use of hormonal contraceptives for more than four or five years can disrupt the balance of estrogen in the body, resulting in abnormal cell changes (14,20). This is one of the triggering factors for cervical cancer, especially if other risk factors, such as exposure to cigarette smoke, trigger it. As in this study, about 80.2% of respondents were exposed to cigarette smoke with carcinogenic ingredients that are very harmful to the body.

Preventive efforts can be made in cervical cancer by conducting education. The intended education is in the form of increased knowledge and information from health workers to family planning acceptors about complaints caused by contraception. In addition, health workers need to provide advice on how to take action to deal with complaints that occur in respondents who use hormonal contraception and change to using non-hormonal contraception if they experience complaints..

5. Conclusion

There is a risk between the age of first sexual intercourse, parity, use of hormonal contraception, and exposure to cigarette smoke with the incidence of cervical cancer. The parity variable is the variable that has the greatest risk of developing cervical cancer at the Undata Regional General Hospital, Central Sulawesi Province. It is expected that people living with cervical cancer avoid free sex and do not have sex at the age of less than 20 years, especially women of childbearing age who are sexually active, to have pap smears at least once every 6 months and have HPV immunization.

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