

# The delay, symptoms, and survival of Ivorian adolescent girls and young adults with uterine cervical cancer

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## ABSTRACT

**Objective:** To generate data on the nature and duration of cervical cancer symptoms, risk factors for delayed consultation, and diagnosis of adolescent and young adult groups in Côte d'Ivoire.

**Methods:** This is a hospital-based cross-sectional study, conducted from July 2012 to May 2018, at the Department of Gynecology of the Yopougon teaching hospital in Cote d'Ivoire. The inclusion criteria were those who were under 40 years of age at the time of diagnosis with oral and written consent. Those whose information was more than 10% insufficient for the standards were excluded from the study. The survey files standardized anonymous pre-established data collected using medical records followed by phone calls.

**Results:** The average age of the participants was  $34 \pm 4.95$  years with a minimum of 21 years. The mean parity per woman was  $3.49 \pm 3.54$ . 34.9% were HIV positive. The median patient delay was 122 days with a long delay in 84.62% of patients. The median time to total diagnosis was 209 days with a longer total delay in diagnosis of 87.18%. 41% of patients honored their treatment, 68.75% of which had received surgery, and 31.25% of which had received chemotherapy. The 5-year survival rate was 65%.

**Conclusion:** The Ivorian health system must focus on primary and secondary prevention, the only guarantee to decrease the morbidity and mortality indicators linked to cervical cancer.

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## 1. Introduction

Cervical cancer is the fourth most common form of cancer in women worldwide with an estimated 569,847 new cases of cervical cancer and 311,365 deaths per year, representing 8.2% of all cancer deaths in women worldwide in 2018.<sup>1</sup> It is the leading cause of cancer mortality in women in many developing countries, accounting for 20%–30% of all female cancers. Nearly 9 out of 10 (87%) cervical cancer deaths occur in less developed regions. In West

Africa, invasive cervical cancer (ICC) has a standardized incidence and mortality rate of 29.3 cases and 18.5 deaths per 100,000 person-years, respectively.<sup>1</sup> More specifically in Côte d'Ivoire, the incidence of ICC was 21.7 cases per 100,000 person-years in 2018 and the estimated mortality was 46.8 deaths per 100,000 person-years. This mortality rate contrasts with the natural history of ICC and its accessibility to easy and reproducible screening as 70% of ICC cases are diagnosed at an advanced stage (FIGO stage III and IV).<sup>2</sup>

ICC rates have steadily increased over the last 20 years among young women,<sup>3</sup> as well as sexually transmitted infections, including Human Papillomavirus (HPV).<sup>4</sup> Inadequate screening, information, and awareness-raising programs and activities are also contributing factors. Furthermore, HPV infection is common among HIV-infected women, including those treated with anti-retrovirals (ARVs), with a prevalence of over 60% regardless of age and accelerated carcinogenesis.<sup>5</sup> In Côte d'Ivoire, the screening program begins at the age of 25, as in Western countries.<sup>6</sup> Earlier screening is being debated and discussed in some countries.<sup>7</sup> While

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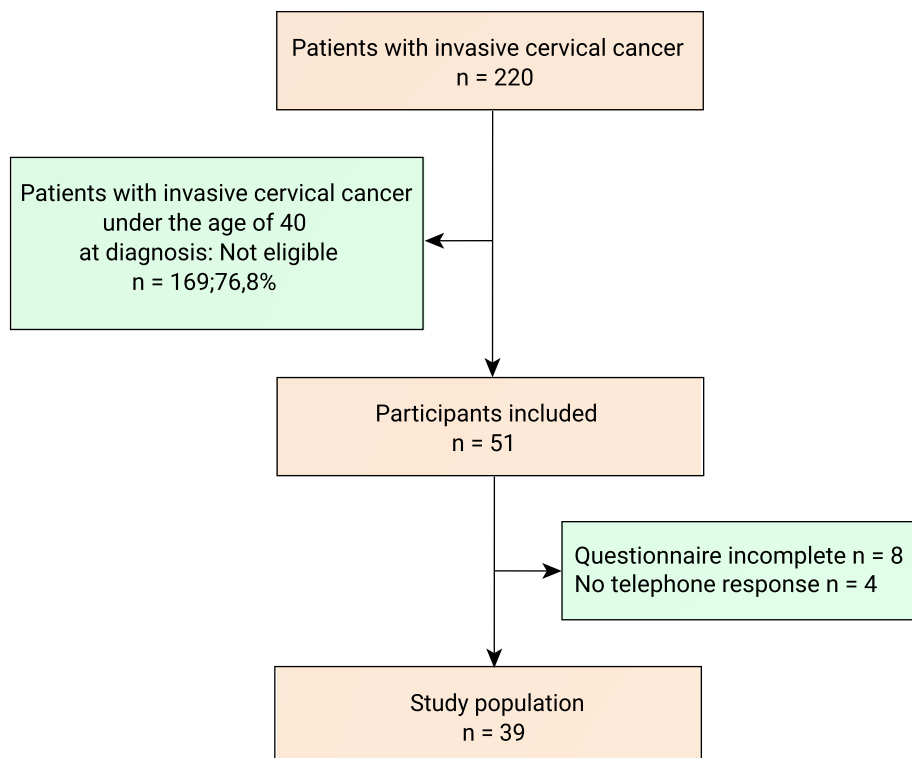


Fig. 1. Flow chart of studied population.

the introduction of testing has reduced the incidence of ICC, it has contributed to diagnostic and patient care delays. During audits carried out among young women with ICC, late diagnoses were the result of failure (among patients and health professionals) to recognize the severity of symptoms, rather than not being screened.<sup>8</sup> The most common symptoms of cervical cancer are post-coital bleeding, metrorrhagia, and vaginal discharge,<sup>8</sup> but they are also common in young women in general (e.g. genital infections)<sup>9</sup> or those taking hormonal contraceptives. Delayed diagnosis has become an important issue in the prevention and treatment of cancer and four components of delay have been identified: patient-related delay, care provider-related delay, referral delay, and health system delay.<sup>10</sup>

Despite a large number of published works on cervical cancer, few studies have been conducted on the prevalence and delay in care of adolescent and young adult patients in light of the long natural history of cancer and the availability of screening. Indeed, the age distribution pyramid in Côte d'Ivoire has a broad base that is rapidly and steadily narrowing as age advances, with 44% of the population under 15 years old and only 6% over 60 years old according to the 2012 demographic health survey.<sup>11</sup> This study aimed to collect data on the nature and duration of symptoms, as well as the risk factors for delayed consultation and diagnosis in a specific population group, namely adolescent and young adult women in Côte d'Ivoire.

## 2. Materials and methods

### 2.1. Study design and participants

This is a hospital-based cross-sectional study, conducted from July 2012 to May 2018, at the Department of Gynecology of the Yopougon Teaching Hospital in Côte d'Ivoire. The study was approved by the Institutional Review Board of the hospital and informed consent was obtained from all participants. The inclusion criteria were those who were under 40 years of age at the time of

diagnosis with oral and written consent. Questionnaire more than 10% incomplete and no telephone response were excluded from the study.

### 2.2. Data collection and analysis

The pre-established surveys covered the following variables: qualitative variables (marital status, level of education, profession, contraceptive method, and HIV status) and quantitative variables (age, age at first sexual intercourse, number of children, number of pregnancies, number of sexual partners, delay of the patient, delay of the health care provider (HCP), delay of referral, delay of diagnosis, and delay of total diagnosis). Determination of the extent of the different delays is defined below.

We had access to the files, which made it easier for us to select subjects. We financed the calls for cases. The interview lasted an average of 15 min face-to-face and 5–10 min by telephone. The interview was reported on a pre-established standardized survey form. Data were analyzed using SPSS software version 20.0. Characteristics were summarized using frequencies with percentages or means. In the univariate analysis, we used the Chi-squared or Fisher test to compare proportions and averages.

### 2.3. Operational definitions

**Symptoms:** Symptoms were defined as any patient complaints leading to a diagnosis of cervical cancer and include faulty vaginal discharge, lower abdominal pain, and abnormal vaginal bleeding. Patients with ICC are those for whom the diagnosis has been made with histological evidence.

**Patient Delay:** The period it takes for a patient to become aware of symptoms until their first visit to an HCP. A duration of more than 60 days was defined as a “long patient delay” and 60 days or less was defined as a “short patient delay”.<sup>12,13</sup>

**Health Care Provider Delay (HCP Delay):** The period between the

**Table 1**

Socio-demographic characteristics of the 39 women under 40 with cervical cancer at Yopougon University Hospital.

Parameters	Number (n)	Proportion (%)
<b>Age(years) (Median, IQR) (35,32–38)</b>		
20–24	3	7.69
25–29	2	5.12
30–34	15	38.46
≥35	19	48.71
<b>Level of Education</b>		
None	16	40.02
Primary	12	30.76
Secondary	8	20.51
Academic	3	7.69
<b>Profession</b>		
Unemployed	20	51.28
Pupil/Student	3	7.69
Liberal	14	35.89
Employee	2	5.12
<b>Marital Status</b>		
Single	9	23.07
Widow/divorced	5	12.82
Cohabitation	21	58.84
Married	4	10.25
<b>Gesture (Median, IQR) (4, 2–5)</b>		
Nulligravida-Primigravida (0–1)	3	7.69
Secundigravida (2–3)	12	30.76
Multigravida (≥4)	24	66.65
<b>Parity (Median, IQR) (3, 2–5)</b>		
Nullipara-Primipara (0–1)	8	20.51
Secundipara (2–3)	14	39.89
Multipara (≥4)	17	43.58
<b>Age of FSI (Median, IQR) (16, 15.5–16)</b>		
≤17 years old	29	74.35
>17 years old	10	15.65
<b>HIV Status</b>		
Negative	14	35.90
Positive	25	64.10

\*FSI: First Sexual Intercourse.

**Table 2**

Admission mode, Circumstance of discovery, macroscopic form of the cervix in the 39 women under 40 years of age with cervical cancer at Yopougon University Hospital.

	Number(n)	Proportion (%)
<b>Admission mode</b>		
Emergency	15	38.46
Consultation	24	61.54
<b>Reason of consultation</b>		
Abnormal Vaginal bleeding	31	79.48
Malodorous leucorrhoea	8	20.52
<b>Speculum installation by an HCP<sup>a</sup></b>		
Yes	11	28.21
No	28	71.79
<b>Macroscopic form</b>		
Ulcerated	22	56.41
Budding	6	15.38
Ulcerobudding	11	28.20
Infiltrant	0	0
<b>Stage at the time of diagnosis (FIGO)</b>		
I	11	28.20
II	11	28.20
III	7	17.94
IV	10	25.64

<sup>a</sup> HCP: Health Care Provider.

patient's first consultation with the HCP and the final referral by the HCP to the Cancer Diagnostic Centre. A period of seven<sup>4</sup> days or less

**Table 3**

Distribution of patients according to the different types of time extensions.

Delays (days)	Number (n)	Proportion (%)
Patient delay (days) (Median, IQR) (122, 62–244)		
<b>Short ≤ 60</b>	6	15.38
<b>Long &gt; 60</b>	33	84.62
<b>Total</b>	39	100.00
Health Care Provider delay (days)		
<b>Short ≤ 7</b>	31	79.48
<b>Long &gt; 7</b>	8	20.52
<b>Total</b>	39	100.00
Reference time (days), (average, min-max <sup>a</sup> ) (5, 0–82)		
<b>Short ≤ 7</b>	35	89.74
<b>Long &gt; 7</b>	4	10.16
<b>Total</b>	39	100.00
Diagnosis waiting time (days), (average, min-max <sup>a</sup> ) (31,9–64)		
<b>Short ≤ 14</b>	4	10.16
<b>Long &gt; 14</b>	35	89.7
<b>Total</b>	39	100.00
Diagnosis total time (days), (average, IQR, min-max <sup>a</sup> ) (209, 113–2592)		
<b>Short ≤ 90</b>	5	12.82
<b>Long &gt; 90</b>	34	87.18
<b>Total</b>	39	100.00

<sup>a</sup> min-max: minimum-maximum.

was defined as a “short HCP delay” and more than seven days was designated as “long waiting time.”

**Referral time:** The time interval between the final date of the referral by the HCP to the diagnostic center with a case of suspected cervical cancer and the date of the patient's first appointment at the Cervical Cancer Diagnostic Centre. A period of seven days or less was defined as “normal” and more than seven days was referred to as “referral delay.” It is the period of the patient's decision and travel time to reach the diagnostic center after consultation by HCP.

**Diagnosis waiting time:** This includes the waiting time for all relevant symptom investigations at the diagnostic center. A period of 14 days or less was defined as a “short waiting time” and more than 14 days was defined as a “long waiting time.”

**Total Diagnosis Time:** The period between the appearance of cervical cancer symptoms and confirmation of the diagnosis. A period of more than 90 days was defined as a “long diagnostic delay” and 90 days or less was defined as a “short diagnostic delay”.<sup>13,14</sup>

Total diagnosis delay = patient delay + HCP delay + referral time + diagnosis waiting time.

In this study, the term “delay” refers to an interval between two specific events in the diagnostic pathway. As there is no standard cut-off point to divide the interval into “short delay” and “long delay,” and it is contextual, such cut-off points for different delays are defined in the context of the socio-cultural and behavioral research of women and the health care system in Côte d'Ivoire.

### 3. Results

39 out of 51 women under 40 years of age constituted our study population (Fig. 1).

#### 3.1. Characteristics of cervical cancer patients

The average age of the participants was 34±4.95 years with a minimum of 21 years. The patients were uneducated, without a fixed income, and single in 40%, 60%, and 36% of cases, respectively. The average parity per woman was 3.49±3.54. 74.3% had their first sexual intercourse before the age of 18 and 34.9% were HIV-positive (Table 1).

**Table 4a**  
Distribution of patients according to different types of delays and according to epidemioclinical factors.

variables	Referral delay			OR	P value	Diagnosis waiting time			Diagnosis total time			OR	P value
	Average (Min-max)	Short n(%)	Long n(%)			Average (Min-max)	Short n(%)	Long n(%)	Average (Min-max)	Short n(%)	Long n(%)		
<b>Age in year</b>													
20–29	2.40(0–7)	5(100)	0(0)	1.00		35.60(21–45)	1(20.00)	4(80.00)	219.20(83–783)	0(0)	5(100.00)	1.00	
39–39	5.60(0–82)	30(88.24)	4(11.76)	1.03	0.970	31.44(9–59)	3(8.80)	31(91.20)	313.74(67–2592)	5(14.700)	29(85.30)		
<b>Education</b>													
Unschooling and primary education	5.50(0–82)	25(86.20)	4(13.80)	1.00		32.67(9–64)	2(6.90)	27(93.10)	354.60(96–2592)	2(6.90)	27(93.10)	1	
Secondary and academic	2.20(0–7)	10(1000)	0(0)	–	–	29.90(9–59)	2(20%)	8(80%)	148.00(67–386)	3(30.00)	7(70.00)	0.2	0.11
<b>Speculum examination at initial consultation</b>													
Yes	4.90(1–10)	10(90.90)	1(9.10)						409.43(67–2592)	3(21.43)	11(78.57)	0.31	<b>0.046</b>
no	4.75(0%)	26(92.86)	2(7.14)						241.00(85–783)	2(8.00)	23(92.00)	1.00	
<b>Marital Status</b>													
Single/divorced	4.21(0–716)	13(92.85)	1(7.14)	1.77	0.630	25.79 (12–45)	3(21.43)	11(78.57)	451.64 (67–2592)	1(21.43)	13(78.57)	0.40	0.43
Married/in relationship	5.68(0–35)	22(88.00)	3(12.00)	1.00		35.44 (9–64)	1(4.00)	24(96.00)	217.60 (67–758)	4(4.00)	21(96.00)	1.00	
<b>Parity</b>													
≤3	2.81(0–14)	21(95.45)	1(4.55)	1.00		32.45 (14–59)	2(9.10)	20(90.90)	323.59 (14–59)	3(13.64)	19(86.36)	1.00	
>3	8.18(0–82)	14(87.5)	3(17.65)	4.50	0.210	31.35 (9–64)	2(11.76)	15(88.24)	273.18 (9–64)	2(11.76)	15(88.24)	1.18	0.86
<b>profession</b>													
Not paid	3.35 (0–10)	22(95.65)	1(4.35)	1.00		31.00 (9–45)	3(13.04)	20(86.96)	316.26 (67–2592)	4(17.40)	19(82.60)	1.00	
Paid	7.75 (0.82)	14(87.50)	2(12.50)	1.50	0.700	33.38 (14–64)	1(6.25)	15(93.75)	280.56 (89–439)	1(6.25)	15(93.75)	3.15	0.31

**Table 4b**  
Distribution of patients according to different types of delays according to epidemioclinical factors.

variables	Patient Delay			OR	P value	First Contact Health Center Provider's Delay			OR	P value
	Average(days) (Min-max)	Short n(%)	Long n(%)			Average(days) (Min-max)	Short n(%)	Long n(%)		
<b>Age (years)</b>										
20–29	177.00(91–365)	0(0)	5(100.00)	1.00	–	4.20(91–365)	4(80.00)	1(20.00)	1.00	
30–39	175.20(21–256)	6(17.69)	28(82.35)			25.94(91–365)	27(79.41)	7(21.59)	1.03	0.97
<b>Education</b>										
Unschooling and primary education	287.93 (30–2566)	3(10.34)	26(89.66)	1.00		30.72(0–16)	22(75.86)	7(24.14)	1.00	
Secondary or academic	114.70(21–365)	3(30.00)	7(70.00)	0.13	<b>0.038</b>	1.12(0–12)	9(90.00)	1(10.00)	0.30	0.28
<b>Speculum examination at the initial consultation</b>										
Yes						0(0–0)	11(100.00)	0(0)		<b>0.018</b>
No						32.10(91–365)	20(71.43)	8(28.57)		
<b>Marital Status</b>										
Single/divorced	285.93(30–2566)	2(14.29)	12(85.71)	0.87	0.887	56.64(0–71)	11(78.57)	3(21.43)	0.91	0.91
Married/in relationship	168.08(21–738)	4(16.00)	21(84.00)	1.00		4.40(0–35)	20(80.00)	5(20.00)	1.00	
<b>Parity</b>										
≤3	243.36(21–2556)	5(22.72)	17(77.27%)	1.00		39.05(21–2566)	16(72.72)	6(27.27)	1.00	
>3	226.60(52–730)	1(5.88)	16(94.12)	4.7.0	0.180	2.59(52–730)	15(88.24)	2(11.78)	0.35	0.25
<b>profession</b>										
Not paid	278.74 (52–2556)	4(17.39)	19(82.61)	1.00		4.35 (0–35)	19(82.61)	4(17.39)	1.00	
paid	189.25 (30–699)	2(12.50)	14(87.50)	1.17	0.680	50.19 (0–716)	12(75.00)	4(25.00)	1.58	0.54

### 3.2. The diagnostic path

52.40% of patients had malodorous vaginal discharge as the earliest symptom. Abnormal vaginal bleeding was the main complaint of 79.50% of women who saw an HCP for the first time. The cervical speculum examination was not performed in 71.80% of subjects, and 28.20% of their symptoms were misinterpreted at the initial consultation with an HCP in the First Contact Health Centre (FCHC). 20.50% of the women had two consultations with an HCP. 38.46% of the patients had been referred urgently without any delay from the provider or were referred with hemorrhagic shock in 15.38% of cases or severe anemia in 23% of cases. At the diagnostic center, ulceration was the most common macroscopic

symptom experienced, which occurred in 56.41% of subjects. Squamous cell carcinoma was the most common histological cell type with 94.83%. 51.28% of patients were at least stage II b of FIGO. (Table 2).

### 3.3. Estimates of diagnostic delays

The median patient delay was 122 days with a long delay in 84.62% of subjects. The extremes were 21 and 2556 days. Even though the average provider delay was 23 days, 79.48% of patients had a short delay. The average referral time was 5 days with more than two-thirds of subjects (89.74%) having a short referral time. From the first visit until diagnosis, the majority (90%) of patients

had to wait for more than two weeks for the diagnosis of cervical cancer (an average diagnosis waiting time of 31 days). The median total time to diagnosis was 209 days with 87.18% of subjects having a longer total diagnostic delay (Table 3).

Tables 4a and 4b presents the details of patient delay, provider delay, referral delay, diagnosis waiting time, and the total distribution of diagnosis delay by epidemio-clinical factors. The total long diagnostic delay (>90 days) was observed more among patients aged 30 years or older (85.30%), and illiterate subjects or primary school students (82.20%). Provider delay was observed at a rate of 87.50% with an average of 126 days among those aged 30–39 years, and at 87.5% with an average of 127 days among those with lower than secondary school education. The total diagnostic delay was found in 100% of patients whose cervix was not examined at the initial consultation with an average of 112 days without the emergency referral.

### 3.4. Treatment, follow-up and prognosis

Only 41% of patients had honored their completed treatment, of which 68.75% and 31.25% had received surgery and chemotherapy, respectively. 47.62% and 38.10% of treated patients were in their first and second year of survival, respectively. This can be explained by the fact that 76.20% (16/21) of them were at most stage IIA and had benefited from radical treatment at 68.75%. Cervical cancer had caused 35.89% of deaths over five years. The majority of patients (85.71%) who died were at least stage IIB according to FIGO and 64.29% (9/14) died without treatment. The patients (8/14) who died were 57.14% HIV positive. The 5-year survival rate was 65% (Fig. 2).

## 4. Discussion

### 4.1. Prevalence and socio-demographic characteristics

The average age of the participants was 34 years (standard deviation ± 4.95) with a minimum of 21 years. Adolescent girls and young adults accounted for 17.62% of the ICC diagnosed and treated during our study period. 74.35% had their first sexual intercourse before the age of 18 and 34.90% were HIV-positive. A study carried out in California,<sup>15</sup> which included a highly-varied and mixed population of 13,624 cervical cancers with complete data on age at diagnosis, race, ethnicity, socioeconomic level, and marital status from 1996 to 2005, used logistic regression to conclude that more than 58% of ICCs involved women under 50 years of age, with 46% of cases in the delayed phase. Older age, low socioeconomic status,

and single woman status predicted the diagnosis of late-stage ICC regardless of race or ethnicity. Some prominent contributing factors outside of race were found in our population, including 40% not attending school, 60% without a fixed income, and 36% living alone which indicated low socio-economic status.

### 4.2. Mode of admission, symptoms

Patients had been referred without any delay from the provider or referral (38.46%) because they had been referred to the emergency department in a state of hemorrhagic shock (15.38%) or for severe anemia (23%). The common initial symptoms were abnormal vaginal discharge, abdominal pain, abnormal vaginal bleeding including post-coital bleeding (PCB), and inter-menstrual bleeding (IMB). Although more than half (52.38%) of patients had abnormal vaginal discharge as their earliest symptom, abnormal vaginal bleeding was the main complaint (79.50%) of women who saw an HCP for the first time compared to 62.70% in Nepal.<sup>13</sup> At least 20.5% (8/39) of the women had two consultations with the HCP and the rest used traditional treatment before seeking emergency care. A cervical examination was not carried out in almost three quarters (71.80%) of cases, close to the observed value of 78% in Nepal, and more than a quarter of their symptoms (28.20%) were misinterpreted at the initial consultation with an HCP compared to 90% in Nepal.<sup>13</sup> These rates could be explained by the fact that patients were consulted at life-threatening and late stages in FCHCs. Patients had an ulcerated cervix in 56.41% of subjects with 79.50% of those showing bleeding as the main symptom at consultation compared to 65.80% in Morocco,<sup>16</sup> whereas 81% of patients were unemployed in Côte d'Ivoire compared to with 80.80% in Morocco. Only 48.72% of the patients were diagnosed at an early stage (IIA) and the rest were diagnosed at an advanced stage (≥IIB) in Côte d'Ivoire as in California and Morocco where 60.1% of the patients were diagnosed at stages IIA-IIIIB.<sup>16,17</sup>

### 4.3. Diagnostic path

This study identified different latency periods in cervical cancer diagnosis, with total diagnostic delays derived from patient delay, provider delay, and diagnostic waiting time. Although no standard definition was found for the concept of delay, studies on diagnostic delay have several common themes regarding the length of the delay as a function of the dates of important events in a patient's diagnostic pathway.<sup>12,14,15,18</sup> A similar determination of cancer diagnostic methods was been applied to previous studies.<sup>12,13,15,19</sup>

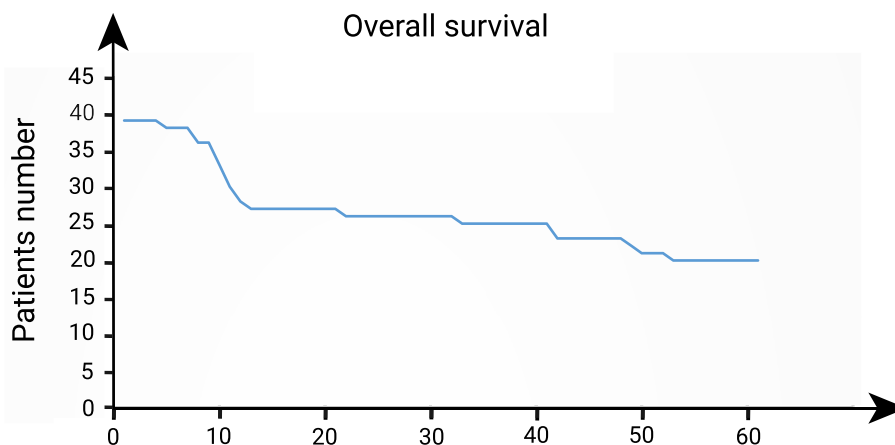


Fig. 2. Overall 60-month survival of 39 patients less than 40 years of age with invasive cervical cancer.

The variation can be found in the point of dichotomization of each type of delay into a long and short delay, but it is highly contextual.<sup>12,20–22</sup> Hansen has categorized delays as short or long according to quartiles and described delays with respect to the median and interquartile range.<sup>12</sup> Other studies have considered some of the periods such as days, weeks, or months for this purpose.<sup>13,14,21–23</sup>

#### 4.4. Estimates of delays in diagnosis

This study revealed that the median patient delay was 122 days with a long delay in 84.16% of patients compared to only 68 days and 57% of patients in Nepal. Similarly, the median provider delay was 23 days with 79.48% of patients with a short delay compared to 40 days with 80.90% of patients with a long delay in Nepal.<sup>13</sup> Referral time was found to be comparatively low (average 5 days) with more than two-thirds (89.74%) having a short referral time, whereas in Nepal it was 68.20%. From the first visit to the diagnostic center, the majority (90%) of patients had to wait more than two weeks for the diagnosis of cervical cancer (mean diagnosis waiting time of 31 days versus 66.20% of patients with a median of nine days in Nepal). The mean value of the total diagnosis delay was 301 days with a median of 209 days and a longer total diagnostic delay in 87.18% was more than 157 days in Nepal with 77.30% delay. This diagnostic delay was found to be higher in both Côte d'Ivoire and Nepal<sup>13</sup> when compared to that of developed countries.<sup>23,24</sup> A high prevalence of long delays in diagnosis of more than three months is extremely unacceptable if the cancer is to be treated at an early stage. The longer the duration of symptoms until a diagnosis is consistent with the high prevalence of advanced cervical cancer in Côte d'Ivoire and Nepal.<sup>10,13</sup> Patient and HCP delay accounted for most of the delays. Indicating a significant delay, Ivorian women had suffered longer patient delay compared to other delays with a wide interval of 8–2256 days as in Nepal.<sup>13</sup> The longer patient delay in Côte d'Ivoire may be due to the influence of patient characteristics such as high levels of illiteracy, poor health consciousness, poor economic conditions, and problematic health behavior such as ignoring mild gynecological symptoms as well as dependence on traditional health care practices.<sup>10,20</sup> In previous studies, researchers have also revealed that patient abilities for recognizing the severity of symptoms and subsequently ignoring increased patient delay in cervical cancer diagnosis.<sup>20,21</sup> In some populations, common symptoms such as vaginal discharge are not recognized as warning symptoms and in most cases assistance is not sought until it becomes unbearably obvious, ultimately leading to increased patient delay and total delay in diagnosis,<sup>13</sup> thereby resulting in 38.46% of an emergency evacuation.

This study establishes that delay caused by HCPs is another major delay in the diagnosis of cervical cancer. Although at a low level, provider delay has also been observed in previous studies, even in developed countries.<sup>12,16</sup> The observation of medical delay in Morocco and Nepal, where 61% and 80.94% of patients suffered a delay of more than 30 days, respectively, was lower in Côte d'Ivoire at only 20.52%.<sup>25</sup> The low proportion of delay by the HCP is because 38.5% of the patients were consulted in a state of emergency either associated with hemorrhagic shock (15.38% of cases) or severe anemia (23% of cases). HCP delay in Côte d'Ivoire can be discussed from various perspectives such as access to services, education level of HCPs, the existing healthcare system, and policy. In both Côte d'Ivoire and Nepal, the first point of contact such as doctors' surgeries, FCHCs, and private medical NGOs at the community level are managed by HCPs with basic medical training. These health care workers often lack knowledge and skills in gynecological examination and cervical cancer screening. In the existing health system in Côte d'Ivoire, not all women have access to gynecologists or

suitable doctors for their gynecological symptoms.<sup>26</sup> This argument is consistent with the findings that women have to visit several health facilities before they are finally referred to an appropriate diagnostic center. The structure of the health care system, the referral mechanism, socio-cultural factors, the level of knowledge of HCPs, and the asymmetrical relationship between HCPs and patients influence patient tracing practices.<sup>27,28</sup> Inadequate knowledge of the etiologies of cervical cancer, alarming symptoms, screening, procedures, and treatments among health practitioners further contribute to delays in diagnosis,<sup>29</sup> eventually leading to the misdiagnosis of cancer. Failure to recognize the vicious symptoms of cancer and/or not being able to provide a cervical examination via the HCP at the initial consultation creates unnecessary visits to different health institutions.<sup>14,30</sup> Patients who complain of alarming symptoms such as abnormal vaginal bleeding or severe pelvic pain often consulted a FCHC in a shorter time than patients with other more mild symptoms such as foul-smelling vaginal discharge. It was only observed that speculum placement by the care provider is often of less interest in women without vaginal bleeding. The duration of the delay has been reported to be shorter in patients who have a gynecological examination by the HCP for patients exhibiting alarming symptoms.<sup>13,14</sup>

The distribution of the length and frequency of each type of delay in diagnosis varied between groups of participants. Older, illiterate, and low-income women experienced longer patient delays, HCP delays, diagnosis waiting times, and total diagnosis delays. Studies have also found that advanced age is a risk factor for delayed diagnosis of cancer, including cervical cancer.<sup>20,21,31</sup> A higher proportion of long delays in some patient groups depict barriers in access to health care and longer delays in diagnosis among this population.<sup>21</sup> The longer total delay in diagnosis (>90 days) was observed more among patients aged 30 years or older (85.30%), and patients who were illiterate or had only primary education (82.2%). Care provider delay was observed at 87.5% with an average of 126 days among those aged 30–39 years, and 87.5% with an average of 127 days among those with less than secondary education. PSS delay and total diagnostic delay were found in 100% of patients whose cervix was not examined at the initial consultation with an average of 112 days outside of the emergency referral.

#### 4.5. Prognosis

Cervical cancer caused 35.89% of deaths among patients, 85.71% of which occurred in the first year after treatment and 91.66% in stages III and IV. The majority of patients who died (85.71%) were diagnosed with at least stage 2 B according to FIGO as in California.<sup>17,32</sup> Among the deaths, 35.71% had started treatment but could not finish it for lack of financial means (three patients dropped out of the first treatment and one dropped out of the fourth treatment, and only one patient of them underwent surgery without chemotherapy). The causes of death are multiple and can be summed up as late diagnoses where patients were seen at an advanced stage (stage III/IV, FIGO) and did not have access to curative treatments. Such cases represented 70–80% of cases in Abidjan which is worsened by the high cost of treatment (CIC).<sup>2</sup> The majority of patients 57.14% who died (8/14) were HIV-positive. A more recent study, again in Abidjan, found that 25% were HIV-positive out of 152 cervical cancer patients, compared to 4.70% HIV-negative patients out of 157 total patients without invasive cancer. This study noted respectively 9% cervical cancer, 52% oncogenic HPV, and 3.90% cervical cancer, 33% HPV in HIV-positive and HIV-negative patients.<sup>5</sup> Respectively, 47.62% and 38.10% of patients were in their first and second year of survival which can be explained by the fact that 76.20% of them were at most at stage IIA. In

California, 68.75% of patients had benefited from radical treatment compared to 90% of 5-year survivor were diagnosed at stage I.<sup>32</sup> In Nigeria, 65 patients with histologically confirmed ICC were followed up with. The majority (72.30%) were diagnosed with advanced stages of ICC. A simple total abdominal hysterectomy was performed in 38.90% of patients who were diagnosed at an early stage of the disease. After a cumulative follow-up of 526.17 months, 35 deaths (54% of follow-ups) occurred with an overall mortality rate of 79.8 per 100 women-years.<sup>33</sup>

## 5. Conclusion

The Ivorian health system must focus on primary and secondary prevention, which is the best and only way to decrease cervical cancer morbidity and mortality indicators.

## Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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