Management of gynecological cancers in the emergency department: Impact of precariousness and prognostic factors

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ABSTRACT

Objective: The primary objective was to determine the profile of patients consulting in an emergency department and diagnosed with a pelvic cancer. Our secondary objective was to assess the potential impact on this diagnostic trajectory on survival.

Method: A single-center retrospective study including patients managed for a pelvic cancer between January 2018 and November 2020 in the Centre Hospitalier Intercommunal de Creteil was conducted. Patients' characteristics were compared based on their diagnostic trajectory (emergency or referred to consultation). Precariousness was assessed using Pascal's tool based on 4 characteristics: being a beneficiary of the former Couverture Maladie Universelle (CMU) or Aide Medicale d'Etat (AME), not having complementary health insurance, being job seeking for more than 6 months and being beneficiary of allowances. A patient was defined as precarious if the Pascal tool was 'TRUE', i.e., at least one positive item. The main socio-demographic and cancer associated factors were analyzed as prognostic factors.

Results: Over the inclusion period, among the 283 eligible patients, 37.3% (87/233) had a diagnosis of cancer following an emergency department visit. There was a significant association between precariousness, rupture of gynecological follow-up, lack of participation in national screening campaigns and the risk of being diagnosed through the emergency pathway for all cancers studied ($p = 0.001$). There was no difference in terms of stage at diagnostic, management (according to current guidelines), prognostic and overall survival between the two groups.

Conclusion: Patients in a situation of precariousness are more likely to be diagnosed with cancer in an emergency department. Our study underlines the importance of precariousness as a factor determining the type of diagnostic management of gynecological cancer. Efforts should be made toward improving frail patients to primary care.

Keywords: MeSH : Pelvic cancers, Precariousness, Social vulnerability, Primary health care, Prevention

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INTRODUCTION

Management of cancer, the leading cause of death in men and second in women after cardiovascular disease, is a major public health issue [1]. Concerning gynecological cancers, breast and pelvic, in 2018 in France, there were 75,796 new cases of cancer, responsible for 19,157 deaths [2]. In various international studies, it has been demonstrated that a social gradient exists in terms of incidence and mortality, with a lower life expectancy for people belonging to socially disadvantaged groups [3–5]. As an example, in a meta-analysis conducted in the United States on ovarian cancer, Karanth and all.[3] demonstrated that lower socioeconomic status (SES) was associated with a 10% increased risk of mortality (RR = 1.10, 95% CI = 1.03 to 1.18, I2 = 80.5%; P < .001) in a pooled analysis of seven studies involving 78,061 patients. Similarly, Njoku and al. [4] uncovered findings in line with this trend regarding endometrial cancer in the United Kingdom. In their study, which encompassed 539 patients, 37.4% belonged to the group categorized as the most disadvantaged according to English indices of multiple deprivation derived from residential postcodes. Their results revealed that women in the middle and most deprived groups had a two-fold increase in cancer-specific mortality (adjusted hazard ratio, HR = 2.00, 95% CI 1.07–3.73, P = 0.030) and a 53% increase (adjusted HR = 1.53, 95% CI 0.77–3.04, P = 0.221) in cancer-specific mortality compared to women in the least deprived group. Notably, there were no differences observed in overall survival.

Precariousness was defined for the first time in 1987 by Joseph Wresinski [6]. It is a multifactorial concept defined by ‘the absence of one or more of the securities that allow individuals and families to assume their professional, family and social obligations and to enjoy their fundamental rights.” Precariousness does not refer to a defined social category but to a progressive and reversible situation that can affect all categories. To determine the impact of precariousness on health, it is necessary to detect it and define its main dimensions in a simple way. Several scores have therefore been developed (EPICES [7], EDI [8]). One of these is Pascal's tool [9]. It has been designed to identify people in precarious situations who come to the emergency department. It focuses on simple, objective elements that can be identified in a short space of time and can be used in retrospective studies. It is based on 4 characteristics: based on 4 items: being a beneficiary of the former Couverture

Maladie Universelle (CMU) or Aide Medicale d'Etat (AME), not having complementary health insurance, being job seeking for more than 6 months and being beneficiary of allowances. A patient is defined as precarious if the Pascal tool is 'TRUE', i.e., at least one positive item. The negative impact of precariousness on gynecological cancers has already been studied on prevention [10–12] and treatment [13–15]. It is also associated with a decrease in access to primary care and consequently an increase in emergency department visits [16].

Some study focused on the impact of poverty on cancer prognosis, and found around 14% of cancers are diagnosed following an emergency department visit [17,18], which was correlated with advanced stage of the disease. *Eliss Brookes and al.* [19] showed that the 1-year survival of patients managed for breast cancer following an emergency department visit was 54% versus 97% after a visit to the primary care physician (p=0.001). Few real-world studies conducted within healthcare systems providing comprehensive coverage and widespread access to primary care have been conducted or published. These studies might hold the potential to offer more precise insights, circumventing the inherent selection bias often associated with cohort studies.

Thus, the aim of this study was to determine the profile of patients consulting in an emergency department and diagnosed with a pelvic cancer. Our secondary objective was to assess the potential impact on this diagnostic trajectory on survival.

METHODS

We conducted a retrospective observational study in the gynecology obstetrics department of the Centre Hospitalier Intercommunal de Creteil (CHIC). Patients managed for pelvic neoplasia between January 1st, 2018, and November 30, 2020, were selected. Patients were classified into two groups according to their pathway; the first group being those with suspected cancer diagnosis following an emergency department visit ("U"), the second being those referred to the CHIC for management ("AC"). Minor patients, patients with neoplasia of non-gynecological etiology, patients for whom clinical data were not available, patients not managed initially in the CHIC and patients consulting for a recurrence of a known treated neoplasia were excluded. The study was approved by the Comite Ethique pour la recherche en Obstetrique et Gynecologie (CEROG) (Number : CEROG 2021 – GYN-1206) [20].

Sociodemographic data collected were those related to social inequalities and precariousness in the literature. Origin, language, marital status, place of residence and socio-professional category according to the INSEE nomenclature of professions and socio-professional categories were analyzed. The CSP+ category corresponds to women farmers, craftswomen, shopkeepers, heads of companies with more than 10 employees, professionals, professors, executives and other higher intellectual professions, foremen, supervisors, paramedics, and technicians. The category CSP- corresponds to employees, service personnel and workers. We collected data about presence of a referring physician, annual gynecologic examination and participation in breast and cervical screening according to current recommendations were analyzed. Precariousness was defined according to the Pascal's tool [21] based on 4 items: being a beneficiary of the former Couverture Maladie Universelle (CMU) or Aide Medicale d'Etat (AME), not having complementary health insurance, being job seeking for more than 6 months and being beneficiary of allowances. A patient was defined as precarious if the Pascal tool was 'TRUE', i.e., at least one positive item. The clinical data analyzed were age at diagnosis, Body Mass Index (BMI), parity, smoking status, performance status according to the World Health Organization (WHO), hormonal status, use of hormonal replacement therapy (HRT), presence of comorbidity assessed by the Charlson's score [22]. This is a comorbidity index designed to predict

one-year mortality. Individuals with a score of 0 have a one-year mortality rate of 12%, those with a score of 1 or 2 have a rate of 26%, a score of 3 or 4 corresponds to a rate of 52%, and those with a score of 5 or higher have an 85% mortality rate. We also collected histological parameters, tumor grade, stage according to the International Federation of Gynecology and Obstetrics (FIGO) classification [23–26]. Management of patients was compared to the recommended theoretical management[23–26]. Time to treatment was calculated in days from the date of the first consultation to the date of the first treatment received when this was performed. Overall, survival was calculated from the date of the first visit.

All statistical analyses were performed using R software (version 1.3.1093). Differences between the main categorical variables were assessed by Chi-2 test or Fisher's exact test depending on the number of participants, and quantitative variables were compared by Student's test. For comparison of continuous variables, a Mann-Whitney's test was used. For all analyses performed, a p-value < 0.05 was considered as a significant difference. Because of the small numbers of patients in the vulvar and vaginal cancer cohorts, only a descriptive analysis was performed. Kaplan Meier survival curves were generated to assess overall survival according to the identified groups. We used a log rank test to compare these curves.

RESULTS

Between January 1st, 2018, and November 30, 2020, 283 patients were managed for a pelvic cancer in the CHI Creteil. Among the 233 eligible patients, 37.3% (87/233) had a suspected diagnosis of cancer following an emergency visit (Figure 1).

The mean age of patients managed for cervical cancer was 57.1 years 68.7, 62.4 and 65 years for endometrial, ovarian, and vulvar cancer respectively. Postmenopausal women represented 78.4% (183/233) of the entire cohort. Vulvar cancer were the rarest cancers, but 46% (6/13) of them were diagnosed following an emergency department visit. Patients with a Charlson score ≥ 5 accounted for 31.2% (73/233) of the entire cohort (Table 1).

Cervical cancer

Clinical characteristics were comparable between the two groups. Patients in group "U" were significantly more likely to be in precarious situations, to have no referring physician, to have had no consultation with gynecologist during the year and to have not participated in a screening program according to the current recommendations. There was no significant difference in terms of origin, marital status, and socio-professional category (Table 2).

Endometrial cancer

Baseline clinical characteristics were comparable between the two groups. Patients managed following an emergency consultation were significantly more likely to be in precarious situation (14/36 or 39% versus 9/52 or 17%, p=0.02). There was no significant difference in socio-demographic origin, gynecological and GP follow-up. Stage at diagnosis, presence of lymphovacular invasion and grade of the tumor were comparable. (Table 3).

Ovarian cancer

Patients in group “U” were significantly younger than those in group “AC” (52.3 years versus 66.5 years, p<0.01). There were significantly more precarious women in the “U” group (8/20 or 40% versus 5?48 or 10%, p=0.01) and they were significantly less likely to have had a consultation with a gynecologist during the year (5/20 or 25% versus 27/48 or 56%, p=0.03). Stage at diagnosis was significantly different between the two groups (p=0.04); 20% (4/20) of patients int the “U” group had stage IV tumor versus 38% (18/48) of patients in the “AC” group (Table 4).

Vulvar cancer

All patients in the “U” group were precarious (6/6 or 100% versus 2/7 or 29% for the “AC” group). Time to management was higher in the “U” group than in the “AC” group (62 days versus 53 respectively). All patients had advanced cancers at the time of diagnosis.

Survival analysis

There was no significant difference in overall survival between the two groups for all cancers (Figure 2). Concerning endometrial cancer, the median follow-up was 0.98 years (95%CI: 0.37-1.7). During this period, 26 patients died, 46% in the “U” group, 9 patients in the “U” group (25%) and 8 patients in the “AC” group (15%) had disease progression. Among patients managed for ovarian cancer, the median follow up was 1.6 years (95%CI: 0.84-1.5), during the follow up, 20% (4/20) of patients in the “U” group and 46% (22/48) in the “AC” group had disease progression and 23 patients died (21.7% in the “U” group). Among those managed for cervical cancer, during a median follow-up of 0.85 years (95%CI: 0.56-1.49), 44% (11/25) of patients in the “U” group and 41% (16/39) of patients in the “AC” group had disease progression (p=0.8) and 25 patients died (40% in the “U” group). Finally, the median follow-up of patient managed for vulvar cancer was 0.76 years (95%CI:

184 0.44-2.21), two patients with had disease progression: one in each study group and 5 died (1/5 in the
185 “U” group).

DISCUSSION

In this work we found that patients presenting in the emergency department with pelvic cancer exhibit various precariousness factors. Specifically, individuals who had not attended regular gynecological follow-ups or had not recently participated in screening programs were more likely to receive their cancer diagnosis during an emergency consultation. Our analysis revealed that the mode of entry into the cancer care pathway did not have impact on overall survival.

Association between precariousness and diagnosis of gynecological cancer after an emergency consultation was previously described by *Bottle and al*. [27] in 2012. In their cohort including 639,064 patients, 139,351 had a cancer diagnosis following an emergency department visit. Populations living in disadvantaged areas had an increased risk of diagnosis through this way (OR = 1.36 95%CI; 1.32-1.40). *Tsang et al* [17] found similar results in their study including 5970 patients managed for cancer between 1999 and 2008 in England, 817 were diagnosed following an emergency consultation. Patients living in deprived areas were at higher risk of diagnosed through this pathway (RR=1.93 95%CI: 1.51 – 2.47, $p<0.01$). In our study, the large part of gynecological cancer diagnosed following an emergency department visit can be explained by the significant poverty rate in the neighborhood of Creteil in 2019 where our study was conducted (26) (around 21% whereas the national rate is of 14%).

In our study, only 20% of patients managed for cervical cancer had had a screening pap-smear within 2 or 3 years according to current recommendations, compared with 44% of patients referred to standard consultation. This result underlines the low participation of this group of vulnerable patients in screening programs and may partly explain the use of emergency department for the diagnosis of malignancy. This is in line with the findings of *Kurani et al* [12] with participation in cervical cancer screening programs. In this study including 126,731 women eligible for cervical cancer screening, probability of performing the recommended screening decreased for those living in the most disadvantaged quintile (Cervical cancer OR = 0.58 95% CI: 0.54 – 0.62). These findings are also reflected in breast cancer screening participation within the same study, which included 78,302 women eligible for breast cancer screening (OR= 0.51 95% CI: 0.46 – 0.57). This was also described by *Smith*

and al [10]. In their meta – analysis, 10 out of the 13 studies included showed a negative association between living in a deprived area and participation in breast cancer screening using deprivation index as standard (EDI score). In our study, we did not analyze breast cancer cases. However, based on our results, it is likely that similar trends would emerge for this cancer as well.

Eliss Brookes and al [19] analyzed the 1-year survival of 739,667 patients managed for cancer between 2006 and 2008 according to the route of diagnosis in the United Kingdom (Screening, Emergency visits, Referred by GP to a specialist in a standard way, Referred by GP in an urgent way "Two Week Referral", Consultation with a specialist not known by the patient and Consultation with a specialist known by the patient). Of these patients, 289,322 had a diagnosis of gynecological cancer. Authors observed a decrease in 1-year survival in patients with a cancer diagnosis following an emergency department visit. Survival rate for ovarian cancer, all diagnostic pathway combined was 70% and 45% via the emergency department, for endometrial cancer, it was 91% and 59% respectively. These results contrast with those in our cohort where being diagnosed in an emergency department had no impact on survival, in every cancer studied. We can explain this difference by (i) the size of the population analyzed; *Eliss-Brookes 's study* was a nationwide study. (ii) the absence of difference in our population regarding age of the patients (contrary to *Elliss-Brookes'study*), which is a major prognostic factor for several gynecological cancers. (iii) the difference system of care across country which is organized in France with a General Practitioner in charge of managing primary care and specialized practicians involved when required by this latter and not by patients themselves.'.

This is the first French study to examine the prognosis of gynecological cancers according to their care pathway. Analysis of route to diagnosis could allow thinking of corrective factors, by reinforcing access to primary care, the first link with specialist physician. Development of gynecological activities by general practitioners, who are already heavily involved in the follow-up of patients could make it possible to improve management by reducing delays before consultation. However, some limitations should be emphasized, particularly those inherent in the retrospective and monocentric nature of the study. During the 2 years of the study, 283 patients were managed for pelvic cancer; 40 patients were excluded from the analysis because of the lack of data concerning

precariousness factor. This choice ensured an exhaustive analysis of the factors associated with management. Finally, the follow-up of our patients was relatively short, and it is possible that a longer follow-up will refine the results obtained, particularly on survival. Concerning evaluation of precariousness, we chose to use Pascal's tools. This choice was guided by retrospective nature of our data collection. By using other scores, such as EPICES, EDI disadvantaged index or the social handicap score, which explore other domains of precariousness, notably standard of living, personal income, cultural and material data; selection of precarious patients would have been more exhaustive to the detriment of the reproducibility of our analysis, We were not able to evaluate the economic impact of the care pathway of precarious patients managed in the emergency department. *Laudicella and al.* [28] in the United Kingdom looked at the reduction in cost of care if patients were redirected to primary care services. They found a reduction of 21.695.01 euros (18.260 pounds) one year after diagnosis of breast cancer if it was diagnosed via a consultation with a primary care physician. Nevertheless, there is ongoing debate regarding the enduring effects on healthcare expenditure resulting from early interventions in primary care, warranting specialized studies to address this question directly.

Common factors explaining the use of emergency visits for diagnosis of each of gynecological cancers were precariousness, absence of gynecological follow up and low participation rate in screening programs. This reflects persistent social inequalities in health in France and the difficulties encountered in accessing care, despite a unique social protection system. Fight against inequalities has been an integral part of health policies since 2004. As with the National Health Strategy 2018-2022, Cancer Plan 2014-2019 [29] had made reduction of inequalities one of its major objectives. One of its axes was to ensure that prevention policies benefit to everyone. Impact of these strategies to improve territorial networking and patient management even when factors of vulnerability exist will have to be evaluated to improve our practices.

CONCLUSION

Patients seen in the emergency department for gynecological cancer have many factors of vulnerability including absence of gynecological follow-up and poor adherence to screening programs. Even if prognosis does not seem to be influenced by the care pathway, setting up a dedicated pathway for people facing precariousness and cancer diagnosis could be useful to improve gynecological cancer care in this population.

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Data Availability Statement: Datasets available upon request.

Conflicts of Interest: The authors declare no conflict of interest.

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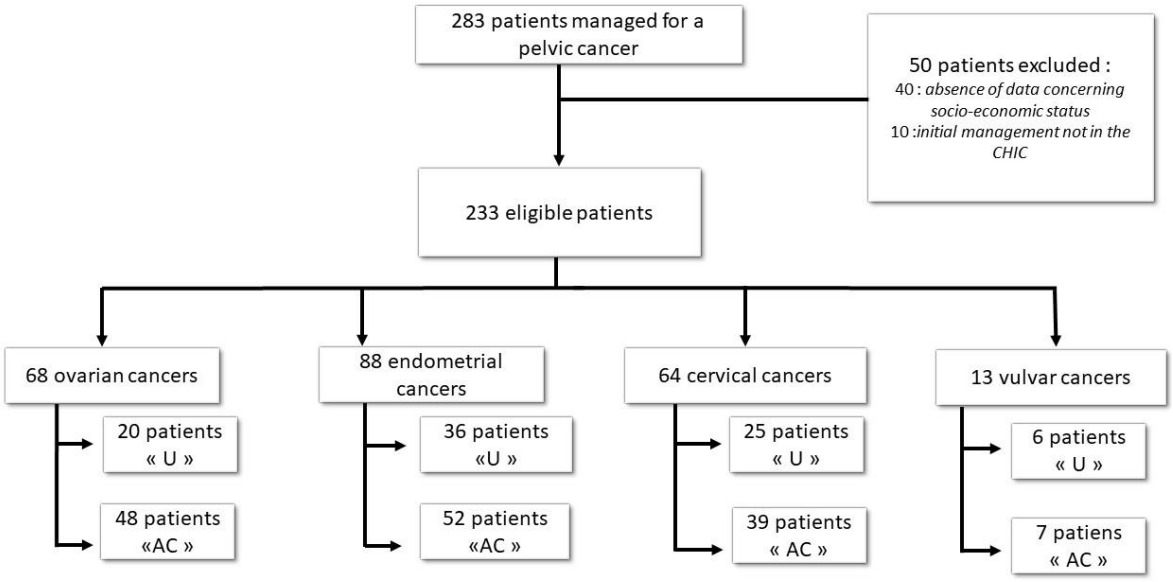
388 *Figure 1 : Flow chart (Abbreviations: Suspected cancer diagnosis following an emergency department visit ("U") / referred*
389 *to the CHIC for management ("AC"))*



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392 *Table 1 : Clinical characteristics of patients according to the cancer*

Characteristics	Cervical cancer N = 64 (%)	Endometrial cancer N = 88 (%)	Ovarian cancer N = 68 (%)	Vulvar cancer N = 13 (%)
Age at diagnosis in years, mean ± SD	57.1 ± 17.3	68.7 ± 13.9	62.4 ± 15.9	65 ± 12.2
Body Mass Index in kg/m2, mean ± SD	25.1 ± 5.6	28.4 ± 8.1	25 ± 5.8	24.42 ± 7.2
Tobacco	23 (35)	15 (17)	17 (25)	2 (15)
Menopausal status	38 (59)	80 (90)	54 (79)	11 (84)
Charlson's score				
0	16 (25)	1 (2)	7 (11)	2 (15)
1 / 2	23 (36)	18 (20)	23 (34)	1 (8)
3 / 4	14 (22)	28 (32)	23 (34)	4 (31)
≥ 5	11 (17)	41 (36)	15 (21)	6 (46)
Performans Status				
0	24 (37)	23 (26)	21 (31)	6 (46)
1	24 (37)	42 (48)	24 (35)	3 (24)
2	7 (11)	13 (16)	15 (22)	2 (15)
3	9 (15)	6 (6)	7 (11)	2 (15)
4	0	4 (4)	1 (1)	0

393

394 *Table 2 : Characteristics of patients managed for cervical cancer according to mode of entry into the care pathway.*

Characteristics	U N = 25 (%)	AC N = 39 (%)	P-value
Origins			0.06
France	7 (28)	25 (64)	
Occidental	3 (12)	3 (8)	
Asia	2 (8)	2 (5)	
Africa	10 (40)	9 (23)	
DOM-TOM	3 (12)	0	
Socio-professional category			0.38
CSP+	1 (4)	5 (13)	
CSP-	11 (44)	11 (28)	
Inactive	11 (44)	12 (31)	
Not known	2 (8)	11 (28)	
Precariousness	16 (64)	12 (31)	**< 0.01**
Place of residence			**< 0.01**
Personnal residence	16 (64)	34 (87)	
*Others **	9 (36)	5 (13)	
General practionner	18 (72)	37 (94)	**0.02**
Gynecological follow-up	2 (8)	21 (53)	**< 0.01**
Screening programs	5 (20)	17 (44)	**0.02**
Histological subtype			0.46
Epidermoïd	22 (88)	32 (83)	
Adénocarcinoma	2 (8)	6 (15)	
Others	1(4)	1 (2)	
Stage			0.82
I	3 (12)	7 (18)	
II	6 (24)	8 (21)	
III	9 (36)	13 (33)	
IV	5 (20)	10 (26)	
Not known	2(8)	1 (2)	
Time to treatment (mean ± SD) in days	45.5 ± 22.1	41.5 ± 24.94	0.47

Abbreviations : suspected cancer diagnosis following an emergency department visit ("U") , referred to the CHIC for management ("AC"), socio-professional category (CSP), others (homeless, housed)*

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396 *Table 3 : Characteristics of patients managed for endometrial cancer according to the mode of entry into the care pathway.*

Characteristics	U N = 36 (%)	AC N = 52 (%)	P-value
Origins			0.16
France	24 (67)	41 (78)	
Occidental	3 (8)	3 (6)	
Asia	0	2 (4)	
Africa	8 (22)	3 (6)	
DOM-TOM	1 (3)	3 (6)	
Precariousness	14 (39)	9 (17)	**0.02**
Marital status			**0.01**
In pairs	14 (39)	36 (69)	
Single	12 (33)	11 (21)	
Widow	10 (28)	5 (10)	
Place of residence			**0.04**
Personnal residence	28 (77)	49 (94)	
*Other**	7 (19)	3 (6)	
General practionner	35 (96)	49 (94)	0.6
Gynecological follow-up	15 (41)	23 (44)	0.8
Hystological subtype			**< 0.01**
Endométrioïd	20 (56)	44 (85)	
Clear cells	2 (6)	1 (2)	
Serous	4 (11)	7 (13)	
Others	10 (27)	0	
Embols	10 (27)	16 (31)	0.76
Stage			0.78
1	17 (47)	39 (75)	
3	6 (17)	5 (10)	
4	4 (11)	8 (15)	
Not known	9 (25)	0	
Time to treatment (mean ± SD) in days	57,1 ± 36.05	48.7 ± 34.5	0.34

Abbreviations : suspected cancer diagnosis following an emergency department visit ("U") , referred to the CHIC for management ("AC"), socio-professional category (CSP), others (homeless, housed)*

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399 *Table 4 : Characteristics of patients managed for ovarian cancer according to the mode of entry into the care pathway*

Characteristics	U N = 20 (%)	AC N = 48 (%)	P-value
Origins			**< 0.01**
France	13 (65)	41 (85)	
Occidental	0	3 (6)	
Asia	0	2 (4)	
Africa	7 (35)	1 (2)	
DOM-TOM	0	1 (2)	
Socio-professional category			**0.01**
CSP+	2 (10)	10 (21)	
CSP-	6 (30)	12 (25)	
Inactive	9 (45)	3 (3)	
Not known	3 (15)	23 (48)	
Precariousness	8 (40)	5 (10)	**0.01**
Place of residence			0.18
Personnal residence	17 (85)	45 (94)	
*Others **	3 (15)	3 (6)	
General practionner	17 (85)	46 (95)	0.57
Gynecological follow-up	5 (25)	27 (56)	**0.03**
Stage			**0.04**
I	11 (55)	9 (19)	
II	0	0	
III	5 (25)	20 (43)	
IV	4 (20)	18 (38)	
Time to treatment (mean ± SD) in days	59.4 ± 64	58.8 ± 63.19	0.98

Abbreviations : suspected cancer diagnosis following an emergency department visit ("U") , referred to the CHIC for management ("AC"), socio-professional category (CSP), others (homeless, housed)*

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Figure 2 : Kaplan Meier curve of patients managed for gynecological cancer according to mode of entry into the care pathway (A : Cervical cancer / B : Endometrial cancer / C : Ovarian cancer)