Fears, feelings and findings about COVID-19 disease in hospitalized cancer patients in a tertiary Hospital in Spain.

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Abstract

Introduction
On March 11th, COVID-19 was categorized as a pandemic. Risk factors for poor outcome in COVID-19 disease include personal history of cancer. The purpose of this research is to explore what do cancer patients know about COVID-19 and their perception of infection risk.

Methods
A pilot questionnaire was initiated in hospitalized cancer patients at a large academic medical center to explore fears and other issues related with COVID-19 disease and cancer patients. A stratified analysis by age, sex, marital status, educational background, number of previous systemic treatments received and hospitalization cause was carried out. $\chi^2$ test, Fisher’s exact test, Spearman’s rank correlation coefficient and Kendall rank correlation coefficient were performed when indicated on each category.

Results
33 patients were included. 66.7% of patients were male and 33.3% female, with a median age of 57 years old. Natural origin hypothesis of novel coronavirus and high educational levels ($\tau_c = 0.260$, $p = 0.040$) had a positive moderate correlation. Young cancer patients are more afraid of a SARS-CoV-2 infection than elderly people ($p=0.034$). Thinking there are differences in COVID-19 symptoms due to cancer treatments had a positive moderate correlation with the number of treatments received ($\tau_b = 0.342$, $p = 0.005$).

Conclusion
Cancer patients need more information about coronavirus and how can affect them. Some of them are not aware of how can cancer increase their risk of infection. However, they agree with measures that hospitals have implemented and don’t feel they affect the quality of care they receive when admitted.

1. Introduction
The novel SARS-CoV-2 virus first appeared at the end of 2019 in China, is now a worldwide problem that has spread rapidly in several other countries in less than two months [1]. On March 11, 2020, COVID-19 was categorized as a pandemic when over 118,000 cases were diagnosed worldwide [2]. By this time, there were 2,965 positives and only 84 deaths in Spain but since then these numbers have been rising dramatically. On April 25, 2020, there were 22,902 deaths caused by COVID-19 in Spain and more than 223,000 positive patients [3].

Risk factors for poor outcome in COVID-19 disease include personal history of cancer [4]. In fact, the odds of dying in infected cancer patients is more than ten times higher than in all non-cancer ones [5]. In spite of these numbers, it has been difficult to create common protocols in order to protect cancer patients and health care workers during hospitalization. Many hospitals have implemented measures to prevent the spread of this new illness while keeping with cancer assistance [6]. Usually those measures include no visitors’ policies, tele assistance, testing patients for SARS-CoV-2 prior admittance and other strict measures [7] never seen before in public hospitals in Spain.

However, no data about what do cancer patients believe about COVID-19 disease has been published yet. Cancer is a complex disease that usually involves psychological consequences and patients have not been asked about what do they think about these tough measures that sometimes include total room isolation during hospitalization with disregard of its cancer affection. No research about what is the real risk perception for SARS-CoV-2 infection in cancer patients has been carried out in these months when this new pandemic has shocked the world. Fears of cancer patients related with COVID-19 disease have not been explored and striking a balance between useful but strict measures and cancer patients special features is now more important than ever.

On March 14th important measures that would affect people’s mobility were implemented by Spanish government as part of the State of Alarm in order to control de SARS-CoV-2 spread [8]. Spanish people should stay at home all day and only leave their houses to buy supplies or in case of major causes, such as medical appointments. On May 4th these restrictions became increasingly loose and people were allowed to leave their houses following some rules.

The purpose of this pilot study is to explore what do hospitalized cancer patients know about COVID-19 and their perception of infection risk, what do they think about the strict measures many hospitals have implemented and how this hospitalization period has changed during State of Alarm from previous, when COVID-19 disease didn’t exist. They will also be asked about time delay for consulting a doctor and being admitted to the hospitalization area.

2. Methods
From 14th March until 4th May, 162 cancer patients were admitted in the hospitalization unit of Medical Oncology Department (MOD) of a tertiary Spanish hospital located in Valencia.

In order to avoid important bias in patient selection, the following criteria were applied:

2.1 Inclusion criteria:
- Patients aged more than 18 years old admitted in the MOD hospitalization area from 14th March until 4th
- Patients with previous admittance in the oncology hospitalization area when COVID didn’t exist. This would avoid bias due to psychological impact of first hospitalization episode in patients newly diagnosed.
Patients who had a PCR SARS-CoV-2 negative result prior to admission.
Patients who were able to complete our questionnaire.

No ethical problems were found when this study was carried out.

2.2 Questionnaire

Clinical and demographical data were collected by reviewing patient medical records. Recorded baseline characteristics included age, sex, marital status, educational background, number of previous systemic therapies received, cause for hospitalization and type of tumor.

Our questionnaire is a psychometric response scale in which responders specify their level of agreement to 25 statements typically in five points Likert scale: (1) Strongly disagree; (2) Disagree; (3) Neither agree nor disagree; (4) Agree; (5) Strongly agree.

Moreover, 5 additional open questions were asked:

- (1b) Where did they receive information about COVID-19 disease?
- (6) Who completed tasks that necessarily implied leaving home?
- (7) Number of positive relatives for COVID-19 disease (if any).
- (13) What would they do if they suspect to be positive for SARS-CoV-2?
- (28) Time delay before consulting in the emergency room prior to this admittance.

Questions 20, 23 and 28 will only be answered by participants that were admitted in the hospitalization area via emergency room (n=19), as they refer to their feelings there.

Patients admitted from March 14th until May 4th filled the questionnaire at day 3 since admission, in order to have enough time to acknowledge the implemented changes in the hospitalization area. An oral informed consent was obtained in all participants.

2.3 Statistical analysis

Data was analyzed by using SPSS Statistics for Windows, v 24.0 (IBM SPSS Statistics for Windows, v 24.0. Armonk, NY: IBM Corp). We performed a stratified analysis by age, sex, marital status, educational background, number of previous systemic treatments received and hospitalization cause. χ² test, Fisher’s exact test, Spearman’s rank correlation coefficient (ρ) and Kendall rank correlation coefficient (Tau-b statistic or Tau-c, τ) were performed when indicated on each analyzed category.

3. Results

Following a sequential study design, a total of 33 patients (n=33) were included in the final analysis (see figure 1). Clinical and demographical characteristics of the sample can be found in table 1.

3.1 Open questions

31 out of 33 patients (94%) received information about COVID-19 disease by television. 12 out of 33 (36%) preferred internet websites to get informed but only 3 out of 33 (9%) declared to visit official sites such as the Spanish Ministry of Health website.

When asked about leaving home, 3 out of 33 (9%) admitted to go for supplies by their own. However, in most cases (14 out of 33, 42%) this task was performed by their partners. 2 (6%) patients also declared that their neighbors brought them provisions to avoid going outside their homes.

Only one patient reported one positive relative.

When asked about what would they do if they experience symptoms that could be due to COVID-19 disease, 12 out of 33 (36.4%) admitted they would call to the special COVID-19 disease information phone number, created by the Spanish government. 30.3% would attend the emergency room, 27.3% would contact their oncologist and only 2 out of 33 (6.1%) would visit their general practitioner first. When stratified analysis was performed by three age groups (18-44, 45-64, >65 years), statistical significant differences were found among the elderly people group (>65 years) that would consult in the emergency room and younger people (18-44) that would call the special COVID-19 disease information phone number (p=0.006).

Patients that were admitted to the hospitalization area via emergency services were asked about time since they first considered visiting the emergency department until they finally attend the hospital. More than half of the patients (52.6%) declared that they decided to wait some days at home before attending the hospital. Among those ten patients who decided to wait before consulting in the emergency department, the mean was 5.9 days, with a median of 4 days and a range of 2-20 days. In 60% of patients the main reason to wait was being afraid of SARS-CoV-2 infection when attending the hospital emergency services.

3.2 Psychometric questions
Results of the 25 psychometric questions are shown in table 2. When stratified analysis was performed, interesting statistical significant results have been found in some statements.

3.2.1 Age

When performing a stratified analysis by age, significant correlation was found in two statements. In statement nº 9, a moderate negative correlation was found (Spearman's rank correlation coefficient, $\rho = -0.483, p = 0.004$) when thinking that antineoplastic treatments make cancer patients more vulnerable to COVID-19 disease and age. In statement nº 18 another negative moderate correlation was detected ($\rho = -0.370, p = 0.034$) showing that young hospitalized cancer patients are more afraid of a SARS-CoV-2 infection in the hospitalization room than elderly people. When asking about discrimination in COVID-19 disease treatment because of a previous cancer condition (which includes limitations in admittance to the intensive care units in some palliative patients), elderly patients believe they are not going to be discriminated negatively for being cancer patients ($p = 0.424, p = 0.014$).

3.2.2 Sex

When performing a stratified analysis by sex, women are more prone than men to be afraid of becoming infected by coronavirus during any stay in the emergency department. 72.7% of women declared to be partially or totally agree with statement 17 in contrast with only 22.7% of men ($p = 0.008$).

3.2.3 Marital status

When filling our questionnaire, married cancer patients believe no discrimination in treatment is going to be suffered if getting infected by novel coronavirus (statement 29) in contrast with single patients who disagree with this statement ($p = 0.002$).

3.2.4 Educational background

When performing a stratified analysis by educational background of cancer patients, statistical significance was found in statements 2 and 3. When asking about what do hospitalized cancer patients believe about the origin of novel coronavirus, a moderate positive correlation was found between natural origin hypothesis and high educational levels ($\tau_c = 0.260, p = 0.040$). In contrast, a moderate negative correlation with educational background ($\tau_c = -3.60, p = 0.005$) was found in statement 3 when patients were asked about a possible human origin of the virus.

3.2.5 Number of previous systemic treatments received

Statistical significance was found in three statements when performing a stratified analysis by the number of previous systemic treatments received. Statement 10 revealed a positive correlation between the number of previous lines received and the assumption that cancer patients can experience COVID-19 disease symptoms in a different way from those people not affected by a tumor ($\tau_b = 0.328, p = 0.034$). Moreover, believing COVID-19 disease symptoms can be different in cancer patient due to the treatment they receive also reveals a positive correlation ($\tau_b = 0.342, p = 0.005$) with the number of previous different treatments administered in cancer patients. More treated cancer patients believe no discrimination is going to be suffered if getting infected by novel coronavirus (statement 29) in contrast with cancer patients that have received less number of previous lines ($\tau_b = 0.304, p = 0.029$).

3.2.6 Hospitalization cause

There was no statistical significance in any statement of the questionnaire when stratified by cause for hospitalization.

4. Discussion

Cancer patients suffer not only from physical impact but also psychological due to their neoplasm. Multiple fears regarding antineoplastic treatment, prognosis and tumor recurrences, are present in the evolution of the cancer disease [9] and novel coronavirus has added an extra stressful situation to our patients. In our questionnaire, more than half of the patients declared to have enough information of this new disease. However, when they are asked if COVID-19 disease can debut with digestive symptoms, which has a prevalence of 15% [10], only a 9.1% strongly agreed with this statement and 48.5% of cancer patients strongly disagreed. Interestingly, no relation was found among 9.1% who selected strongly agree and the only 9% who declared to get information in official websites. When facing a new disease is more important than ever to encourage our patients to search high quality information in official and verified websites [11]. As a new disease, many conspiracy theories try to find its place [11] and our patients are especially vulnerable to them. It is important to highlight at this point that education still remains one of the most important antidotes [12]. As shown before, the hypothesis of a possible human origin of novel coronavirus was more likely to be supported among those patients with lower educational background. This results are supported by other authors that found that lower education predicted increased conspiracy belief, a finding that was partially mediated by lower analytic-thinking skills [12-13].

A retrospective study of 1,524 patients with cancer revealed a higher risk of COVID-19 (odds ratio [OR], 2.31; 95% CI, 1.89-3.02) compared with the community [14]. Another study showed that among patients infected with SARS-CoV-2, those with malignant tumors progress to severe disease more rapidly than non-cancer patients (13 vs. 43 days, $p < 0.0001$) and severe cases were approximately five times higher in cancer patients than in the general population (39% vs. 8%, $p=0.0003$) [15]. Williams et al [16] concluded that cancer patients have >5% mortality compared to cancer-free patients. However, when our patients were asked about their risk of COVID-19 disease due to its cancer condition, no statistical significance was found. This is an important finding that makes us wonder if we are truly transmitting the risk of infections when we discuss with our patients in their regular visits. Moreover, this non statistical significance is especially important because our patients believe to have enough information of the virus.
When asking about the perception of risk infection, our patients are afraid of coronavirus disease but they feel safe in both the emergency department and hospitalization area. Moreover, they strongly believe proper measures have been adopted in both emergency room and hospitalization. Visitors are not allowed at the moment in our hospital in order to reduce the flow of people [17]. However, as other authors have already discussed, we understand that our patients are often dependent and need someone inside their room to help them during the hospitalization period [18]. As a result, our patients are permitted to be accompanied by only one person. This measure contrasts with our hospital daily basis before the coronavirus crisis, when non-limited visitors were allowed as part of the open-door hospital policy. However, when asking patients about this measures 84.8% claimed they are not only useful but necessary. They surprisingly don't demand more than one visitor in their room and some of them even claim their stay was more relaxed than in previous hospitalizations periods because they don't feel overwhelmed by lots of different visitors along the day. When patients are asked about how did they feel during this hospitalization period compared with previous ones, they claimed quality of care received in the hospitalization area by both nursing and doctors has not changed from other times, in spite of strict measures have been implemented.

One important conclusion of this study is that more previously treated cancer patients are more aware of a SARS-CoV-2 infection with non-typical symptoms. However, this group of patients also claimed that they wouldn't suffer any discrimination if infected by coronavirus, including ICU admittance. This is another important result as long as more advanced cancer patients believe more measures are going to be carried out on them because they are more ill. Our perception is more advanced cancer patients are not aware of ICU admission criteria or even COVID-19 treatment criteria which sometimes include a strict analysis of the long-term prognosis in each particular case.

Time delay at home before consulting is something that has worried us in the last months. Those who waited, which are about the 50% of them, were admitted in poorer conditions that contributed to longer stays, more difficulties in treating their actual problem and even death in some occasions. These are important indirect consequences of novel coronavirus because patients reported that their fears to become infected kept them longer at home.

4.1 Study limitations

Our limitation in this study is the low sample as a consequence to avoid bias as explained before in patients and methods. Moreover, Ewing sarcoma was the most frequent tumor, which is not the most common finding in large series where lung is the most frequent neoplasm. However, our institution is a soft tissue tumors referral center so these are one of the most common hospitalized cancer patients.

4.2 Clinical implications

It is important to know what do cancer patients believe about novel coronavirus in order to give them solid information about this disease. They have to be educated in when to attend emergency room in spite of coronavirus crisis in order to avoid delays that imply important complications. Expectations about what kind of measures will they receive if infected should be also discussed with them and with their families in context of the long-term prognosis in each particular case.

5. Conclusion

Our patients need more information about coronavirus and how can affect them as a cancer patient. In fact, some of them are not aware of how can cancer and antineoplasm treatments increase their risk of infection. They strongly agree with measures that hospitals have implemented and don't feel they affect the quality of care they receive when admitted. Negative consequences of novel coronavirus are not only direct deaths but also indirect poorer outcomes of those patients who decided to wait at home.

We are experiencing an extraordinary scenario that we have never seen before. Even other pandemic diseases such as Ebola virus didn't have the impact SARS-CoV-2 is having in our society and both patients and professionals are really concerned about how it will develop the next months. Cancer patients have spoken and now is our responsibility to solve their answers, listen to their fears and help them in these difficult months we are facing.

Declarations

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Conflicts of interests

The authors declare that they have no conflict of interest.

Consent to participate

Verbal informed consent was obtained prior to the interview.

Our study was approved by IIS La Fe CEIm ethics committee (nº 2020-356-1) and all patients gave their consent to participate in the present study.
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Tables
Table 1. Demographic and baseline clinical characteristics of hospitalized cancer patients included in our study.

| Characteristic                                      | N = 33 |
|-----------------------------------------------------|--------|
| **Age – yr**                                        |        |
| Mean                                               | 51.2   |
| Median                                             | 57     |
| Range                                              | 18-81  |
| **Sex – nº. (%)**                                   |        |
| Male                                                | 22 (66.7) |
| Female                                              | 11 (33.3) |
| **Marital status – nº. (%)**                        |        |
| Single                                              | 10 (30.3) |
| Married                                             | 22 (66.7) |
| Separated/divorced                                  | 1 (3)   |
| **Educational background – nº. (%)**                |        |
| Not attended school                                 | 1 (3)   |
| Primary and secondary school                        | 15 (45.5) |
| Professional training                              | 6 (18.2) |
| High levels and university                          | 11 (33.3) |
| **Previous systemic therapies received – nº. (%)**  |        |
| None                                                | 13 (39.4) |
| 1                                                   | 12 (36.4) |
| 2                                                   | 6 (18.2)  |
| 3                                                   | 1 (3)     |
| >3                                                  | 1 (3)     |
| **Hospitalization cause – nº. (%)**                 |        |
| Intravenous chemotherapy administration             | 11 (33.3) |
| No tumor related symptoms                           | 11 (33.3) |
| Poor controlled symptoms                            | 11 (33.3) |
| **Type of tumor – nº. (%)**                         |        |
| Ewing sarcoma                                       | 6 (18.2)  |
| Lung cancer                                         | 4 (12.1)  |
| Pancreatic cancer                                   | 4 (12.1)  |
| Breast cancer                                       | 3 (9.1)   |
| Bile duct cancer                                    | 3 (9.1)   |
| Lymphoma                                            | 2 (6.1)   |
| Osteosarcoma                                        | 2 (6.1)   |
| Soft tissue sarcoma                                 | 2 (6.1)   |
| Colorectal cancer                                   | 2 (6.1)   |
| Kaposi’s sarcoma                                    | 1 (3)     |
| Kidney cancer                                       | 1 (3)     |
| Head & neck cancer                                  | 1 (3)     |
| Adrenal cortical carcinoma                          | 1 (3)     |
| GIST                                                | 1 (3)     |
## Table 2. Questionnaire results.

| Statement                                                                 | n (%)                                                                 | Strongly disagree | Disagree | Neither agree nor disagree | Agree | Strongly agree | Univariate qualitative analysis * |
|---------------------------------------------------------------------------|----------------------------------------------------------------------|-------------------|----------|---------------------------|-------|----------------|----------------------------------|
| (1) I have received enough information about COVID-19 disease on a daily basis. |                                                                     | 1 (3)             | 2 (6.1)  | 4 (12.1)                  | 8 (24.2) | 18 (54.5)     | 0.000                            |
| (2) I believe the novel coronavirus has been created by nature without human intervention. |                                                                     | 10 (30.3)         | 9 (27.3) | 9 (27.3)                  | 3 (9.1)  | 2 (6.1)        | 0.070                            |
| (3) I believe the novel coronavirus has been created in a laboratory.       |                                                                     | 3 (9.1)           | 2 (6.1)  | 9 (27.3)                  | 8 (24.2) | 11 (33.3)     | 0.055                            |
| (4) I would be able to identify COVID-19 disease symptoms.                 |                                                                     | 0 (0)             | 2 (6.1)  | 4 (12.1)                  | 3 (9.1)  | 24 (72.7)      | 0.000                            |
| (5) Everyone living in my house has kept strict isolation.                 |                                                                     | 1 (3)             | 0 (0)    | 2 (6.1)                   | 2 (6.1)  | 28 (84.8)      | 0.000                            |
| (8) I believe I am more vulnerable to COVID-19 disease due to my cancer condition. |                                                                     | 5 (15.2)          | 4 (12.1) | 5 (15.2)                  | 7 (21.2) | 12 (36.4)      | 0.182                            |
| (9) I believe I am more vulnerable to COVID-19 disease due to the antineoplastic treatment I receive. |                                                                     | 5 (15.2)          | 3 (9.1)  | 7 (21.2)                  | 7 (21.2) | 11 (33.3)      | 0.255                            |
| (10) I believe COVID-19 disease manifestations could be different in me due to my cancer condition. |                                                                     | 5 (15.2)          | 6 (18.2) | 8 (24.2)                  | 8 (24.2) | 6 (18.2)       | 0.896                            |
| (11) I believe COVID-19 disease manifestations could be different in me due to the antineoplastic treatment I receive. |                                                                     | 4 (12.1)          | 6 (18.2) | 8 (24.2)                  | 9 (27.3) | 6 (18.2)       | 0.680                            |
| (12) I believe diarrhea may be the only manifestation of COVID-19 disease. |                                                                     | 16 (48.5)         | 1 (3)    | 8 (24.2)                  | 5 (15.2) | 3 (9.1)        | 0.000                            |
| (14) I would avoid unnecessary visits to the emergency room which I would only attend if extremely necessary. |                                                                     | 1 (3)             | 0 (0)    | 1 (3)                     | 5 (15.2) | 26 (78.8)      | 0.000                            |
| (15) If I had any illness, I would visit my general practitioner first instead of the emergency hospital department. |                                                                     | 23 (69.7)         | 1 (3)    | 4 (12.1)                  | 0 (0)   | 5 (15.2)       | 0.000                            |
| (16) I am afraid of getting infected by SARS-CoV-2.                         |                                                                     | 2 (6.1)           | 2 (6.1)  | 8 (24.2)                  | 9 (27.3) | 12 (36.4)      | 0.027                            |
| (17) I would be afraid of getting infected by SARS-CoV-2 if I visited the emergency room. |                                                                     | 15 (45.5)         | 4 (12.1) | 1 (3)                     | 6 (18.2) | 7 (21.2)       | 0.002                            |
| (18) I was afraid of getting infected by SARS-CoV-2 when I was hospitalized at the oncology department. |                                                                     | 24 (72.7)         | 3 (9.1)  | 2 (6.1)                   | 2 (6.1)  | 2 (6.1)        | 0.000                            |
| (19) I am wearing gloves and a mask when attending hospital by any reason. |                                                                     | 0 (0)             | 2 (6.1)  | 1 (3)                     | 1 (3)   | 29 (87.9)      | 0.000                            |
| (20) I believe proper measures have been adopted in the emergency room in order to avoid COVID-19 disease transmission. ** |                                                                     | 0 (0)             | 0 (0)    | 4 (12.1)                  | 15 (45.5) | 0.012          |                                  |
| (21) I believe proper measures have been adopted in the hospitalization area in order to avoid COVID-19 disease transmission. |                                                                     | 0 (0)             | 0 (0)    | 1 (3)                     | 4 (12.1) | 28 (84.8)      | 0.000                            |
| (23) I believe emergency care quality received this time was worse than other previous times when coronavirus didn’t exist. ** |                                                                     | 12 (36.3)         | 0 (0)    | 4 (12.1)                  | 1 (3)   | 2 (6.1)        | 0.001                            |
| (24) I believe hospitalization care quality I have received this time has been worse than other previous times when coronavirus didn’t exist. |                                                                     | 22 (66.7)         | 6 (18.2) | 3 (9.1)                   | 0 (0)   | 2 (6.1)        | 0.000                            |
| (25) I've been informed |                                                                     | 2 (6.1)           | 1 (3)    | 0 (0)                     | 4 (12.1) | 26 (78.8)      | 0.000                            |
about the new measures
visitors have to adopt.

(26) I've been informed about changes in the hospitalization area during coronavirus pandemic.

|   |   |   |   |   |
|---|---|---|---|---|
|   | 2 (6.1) | 1 (3) | 2 (6.1) | 3 (9.1) | 25 (75.8) |
|   |   |   |   |   | 0.000 |

(27) I believe strict measures such as only one visitor per patient, compulsory masks... are useful and necessary.

|   |   |   |   |   |
|---|---|---|---|---|
|   | 0 (0) | 1 (3) | 2 (6.1) | 2 (6.1) | 28 (84.8) |
|   |   |   |   |   | 0.000 |

(28) I believe strict measures such as only one visitor per patient, compulsory masks... are useful and necessary.

|   |   |   |   |   |
|---|---|---|---|---|
|   | 3 (9.1) | 2 (6.1) | 1 (3) | 4 (12.1) | 23 (69.7) |
|   |   |   |   |   | 0.819 |

(29) I believe strict measures such as only one visitor per patient, compulsory masks... are useful and necessary.

|   |   |   |   |   |
|---|---|---|---|---|
|   | 1 (3) | 0 (0) | 2 (6.1) | 9 (27.3) | 21 (63.6) |
|   |   |   |   |   | 0.000 |

(30) I believe I would be able to avoid contagion and arrive to the vaccine administration.

* Chi square test / Fisher exact test. ** n = 19, patients admitted via hospitalization area.

** Figures **

![Figure 1](image)

Figure 1

Total number of patients included in the final analysis.