

OBELISCO-SAC Registry OBsErvations from cLinics, Institutions and Cardio-Oncology services SAC

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ABSTRACT

Background: Cardio-oncology (CO) is a new discipline that generates new work areas within the institutions. We ignore how many CO teams exist in our country, their structure and how patients are managed.

Objectives: Our primary objective is to report how many CO centers exist in our country, and how many of them work according to the recommendations of guidelines and consensus statements. We also want to define the specialty and specific training of the physicians involved, determine if they perform risk assessment before cancer treatment, establish the method used to assess ventricular function and how biomarkers are used.

Methods: The OBELISCO registry is a national, multicenter, cross-sectional, descriptive and prospective registry including 51 general hospitals, cancer centers and institutions specialized in cardiology with CO work groups or services.

Results: Of the 51 centers, 47.1% were public and 52.9% were private. Most centers were in the Autonomous City of Buenos Aires (49%) and in the Province of Buenos Aires and the rest were distributed throughout the country. Of 47 centers, 48.9% considered that their institution had CO services complying with the recommendations of international guidelines and the consensus statement of the Argentine Society of Cardiology. Global cardio-oncological or cardiovascular risk assessment is always performed in 27.7% of the centers before starting treatment. Patients who will start potentially cardiotoxic treatment are always referred to Cardiology in 35.3% of the centers and are sometimes referred to Cardiology in 47.1%. Baseline echocardiography is performed in all the patients before starting treatment in 43.1% of the centers and only in some patients in 56.9%. During follow-up, echocardiography is indicated according to the treatment schedule used in 64.7% and according to the patients' outcome in the rest of the centers. All the centers evaluate left ventricular ejection fraction with echocardiography, and 68.1% use two-dimensional echocardiography. Global longitudinal systolic strain is used in 63.8% of the centers. Only 47.1% order cardiac magnetic resonance imaging in some patients, and 35.3% indicate cardiac computed tomography scan. Biomarkers are used in only 7.8% of the centers. Primary prevention with neurohormonal antagonist drugs is always indicated in 5.9% of the centers. Dexrazoxane is used in only 5.9% and liposomal anthracycline in 74.5%. If cardiotoxicity develops, 76.5% indicate cardioprotection, 41% discontinue chemotherapy and 47% modify cancer treatment.

Conclusions: This is the first national CO registry. It provides information and a current outlook of the status of this subspecialty in our country. Almost 50% of the centers considered to be functioning in line with guidelines and consensus statements. Only in one third of centers, the patients who will initiate cancer treatment with potentially cardiotoxic drugs are referred to CO. Two-dimensional echocardiography is the method most used in our country to evaluate ventricular function; biomarkers are scarcely used.

Keywords: cardio-oncology, institutions, services, cardiotoxicity, echocardiography, magnetic resonance imaging, biomarkers, primary prevention, radiotherapy

RESUMEN

Introducción: La cardio-oncología (CO) es una nueva disciplina, que genera nuevas áreas de trabajo en las instituciones. Desconocemos cuántos equipos de CO existen en nuestro país, su estructura y el manejo de los pacientes.

Objetivos: Nuestro objetivo primario es reportar cuántos centros de CO existen en nuestro país, y de ellos cuántos trabajan de acuerdo con las recomendaciones de guías y consensos. Secundariamente, definir la especialidad y formación de los médicos integrantes, si se realiza evaluación de riesgo previo al inicio del tratamiento oncológico, cómo se evalúa la función ventricular y cómo se utilizan los biomarcadores.

Material y métodos: Registro nacional, multicéntrico, transversal, descriptivo, y prospectivo que incluyó 51 instituciones generales, de oncología y/o de cardiología que referían poseer grupos de trabajo o servicios de CO.

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Resultados: De los 51 centros, pertenecen al ámbito público el 47,1% y al privado el 52,9%. El 49% se halla en la Ciudad Autónoma de Buenos Aires, el 17,6% en la Provincia de Buenos Aires y el resto en otros lugares del país. Sobre 47 centros, el 48,9% considera funcionar de acuerdo con las recomendaciones de Guías Internacionales y el Consenso de la Sociedad Argentina de Cardiología. El 27,7% de los centros realiza siempre estratificación de riesgo cardio-oncológico o cardiovascular antes de iniciar el tratamiento. Un 35,3% de los centros deriva siempre a cardiología a los pacientes que iniciarán un tratamiento potencialmente cardiotoxico, un 47,1% ocasionalmente. El 43,1% de los centros realiza ecocardiografía basal en todos los pacientes, el 56,9% solo en algunos. Durante el seguimiento el ecocardiograma se indica de acuerdo con el esquema utilizado en el 64,7% y en el resto según su evolución. Todos los centros evalúan la fracción de eyección ventricular izquierda mediante ecocardiografía, en el 68,1% bidimensional. El 63,8% utiliza el análisis de la deformación longitudinal sistólica global. El 47,1% deriva algunos pacientes a resonancia cardíaca y el 35,3% a tomografía cardíaca. Solo el 7,8% utiliza biomarcadores. El 5,9% indica siempre prevención primaria con antagonistas neurohormonales. El dextrazoxano es utilizado en el 5,9%, la antraciclina liposomal en el 74,5%. Frente a la aparición de cardiotoxicidad, el 76,5% inicia tratamiento cardioprotector. El 41% suspende la quimioterapia, el 47% la modifica.

Conclusiones: este es el primer registro nacional de CO. Brinda información y un panorama actual del estado de esta subespecialidad en nuestro país. Casi la mitad de los centros consideró funcionar de acuerdo con Guías y Consensos. Solo un tercio de los pacientes que van a iniciar tratamiento oncológico potencialmente cardiotoxico son derivados a CO. El método más utilizado en nuestro país para evaluar la función ventricular es el ecocardiograma bidimensional, los biomarcadores son poco utilizados.

Palabras claves: Cardio-Oncología - Instituciones - Servicios - Cardiotoxicidad - Ecocardiografía - Resonancia Magnética - Biomarcadores - Prevención Primaria- Radioterapia

INTRODUCTION

Few areas of medicine have experienced so intense growth in just a few years as cardio-oncology (CO). As patients survive longer, there is a growing demand for trained physicians and adequate institutions to respond to a population living with a disease that will become chronic and with adverse effects. In turn, the collaborative nature between the different specialties demands us to acknowledge where we are on the growth curve in our country and to produce our own relevant information.

Cancer therapy-related cardiac dysfunction (CTRCD) induced by drugs or radiotherapy, commonly known as cardiotoxicity, represents one of the most dreaded complications of cancer treatment. It depends on three factors: global cardio-oncology risk, type of cancer and planned therapy. (1-10)

The global or cardio-oncology risk profile includes age, cardiovascular risk factors (CVRF), history of cardiovascular disease, history of potentially cardiotoxic chemotherapy agents and history of radiation therapy (young age at time of radiotherapy, irradiation of the left side of the thorax, high radiation doses, inadequate shielding and concomitant chemotherapy, among others). (9, 12-20)

The type of cancer is associated with variable cardiovascular involvement; embolic events are more common in patients with pancreatic cancer, intramyocardial tumors are usually the substrate of arrhythmias and cardiac metastases from lung cancer, breast cancer or renal cell carcinoma can generate valvular dysfunction (valve obstruction or regurgitation) and vascular involvement (obstruction of the venae cavae or pulmonary veins). (9-12)

Finally, the planned chemotherapy/radiotherapy regimen affects the risk of cardiotoxicity depending on the drugs used, type of drug, planned/cumulative dose, route of administration and/or the combination with other antineoplastic drugs. (13-15)

The position statements of the different scientific

societies, the guidelines of the European Society for Medical Oncology (ESMO) and the American Society of Clinical Oncology (ASCO) and the recent European Society of Cardiology (ESC) guideline on cardio-oncology suggest "global and standardized cardiovascular and oncological risk assessment", monitoring potentially cardiotoxic treatments (avoiding unnecessary interruptions of chemotherapy/radiotherapy and reducing the risk of CV complications) and adequate follow-up. (9-12)

Several publications have reported higher risk of CV events in populations with inadequate or absent risk stratification before potentially cardiotoxic treatment, suboptimal control of CVRF during different oncological therapies, late detection of CTRCD (ventricular dysfunction, hypertension, myocarditis, pulmonary hypertension, arrhythmias, coronary artery disease, etc.) and inadequate follow-up of populations that received potentially cardiotoxic therapies (radiotherapy, chemotherapy or both). (1,2,12,16-19)

The actual rate of cardiovascular evaluation before cancer treatment in different countries is unknown. In addition, more than half of cancer patients with cardiovascular disease do not receive optimal treatment of their disease, and their risk factors are not controlled when cancer treatment is initiated. Many of them are never referred to cardiology despite their cardiovascular risk or the potentially cardiotoxic treatment they will receive.

Furthermore, there is great disparity about the use of complementary tests for cardiovascular assessment during cancer therapy (echocardiography, nuclear medicine imaging, cardiac magnetic resonance imaging, and biomarkers as troponins, BNP, and D-dimer). (20-28)

All these facts highlight the importance of adequate monitoring of cancer patients before, during and after each treatment. However, so far, we do not count with information about the structure and functioning of CO services in our environment, so ignore

how cancer patients are managed in each institution. For this reason, the Council on Cardio-Oncology of the Argentine Society of Cardiology decided to carry out this study to learn how several centers with CO services or work groups are functioning in our country.

Our primary objective is to report how many CO centers exist nationwide, and how many of them work according to the structure and function recommended by guidelines and consensus statements. We also want to learn about the specialty and specific training of the physicians involved, determine if they perform risk assessment before cancer treatment, establish the method used to assess ventricular function and how biomarkers are used.

METHODS

The OBELISCO registry is a national, multicenter, cross-sectional, descriptive, and prospective registry developed by the Council on Cardio-Oncology of the Argentine Society of Cardiology during September and October 2022. The fifteen members of the executive committee contacted physicians (cardiologists, oncologists, or hematologists) from 168 medical centers in several Argentine provinces (public and private hospitals and institutions specialized in cardiology, oncology or with multiple specialties). Only those institutions that reported CO services or work groups were surveyed. The survey included 30 (thirty) structured questions (see supplementary appendix). Study data were collected and managed using REDCap (Research Electronic Data Capture, a web-based software platform) electronic data capture tools.

Those centers dealing with less than 50 cancer patients per month and those without a CO service or work groups were excluded from the study.

Ethical considerations

The registry was approved by the Committee on Ethics of the Argentine Society of Cardiology. Since this study is a survey that does not involve patients and the data of the

respondents and their institutions will be kept anonymously, informed consent was not required in accordance with national and international standards for research on human subjects.

Statistical analysis

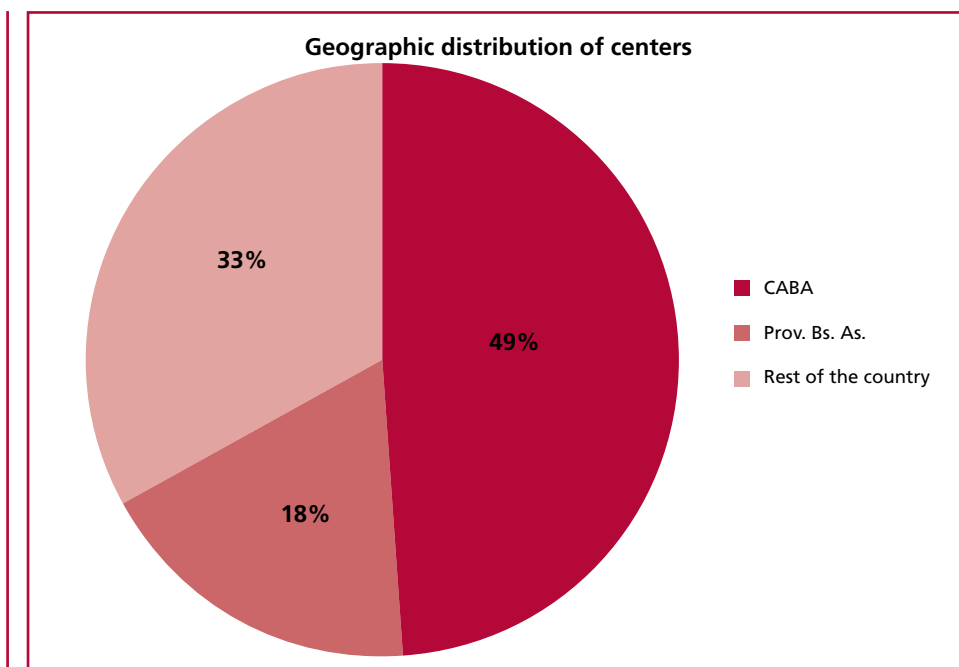
Quantitative variables are expressed as mean \pm standard deviation (SD), or median and interquartile range (IQR 25-75), according to their distribution, and are compared using the corresponding tests. Categorical variables are expressed as percentages and compared using the chi-square test or Fisher's test, as applicable.

RESULTS

Of the 168 medical institutions in our country contacted, 51 reported that their center routinely treated cardio-oncology patients. The survey respondents were cardiologists in 84.3% of cases ($n = 43$), oncologists in 13.7% ($n = 7$) and hematologists in 2% ($n = 1$). A total of 24 centers (47.1%) were public hospitals and the remaining 27 (52.9%) were private institutions. Most centers were in the Autonomous City of Buenos Aires (49%, 25 centers) and in the Province of Buenos Aires (17.6%, 9 centers), while 33.4% were distributed throughout the rest of the country (Figure 1).

Forty-five centers (88.2%) were general hospitals; 7.8% ($n = 4$) were institutions specialized in cardiology care, and the rest were cancer centers. Most institutions (49%, $n = 25$) had > 15 cardiologists, 13.7% ($n = 7$) between 11 and 15, 9.8% ($n = 5$) between 6 and 10, and 19.6% ($n = 10$) between 1 and 5. The distribution of oncologists and hematologists was as follows: 13.7% had > 15 oncologists or hematologists, 7.8% between 11-15, 27.5% between 6-10, 35.3% between 1-5 and 7.8% of the institutions surveyed had no oncologists or hematologists.

Fig. 1. PDistribution of centers



Of 47 centers, 48.9% (n = 23) considered that they had CO services complying with the recommendations of the international guidelines and of the consensus statement of the Argentine Society of Cardiology. Thirty (63.8%) respondents knew that their professionals participated in courses and scientific activities related with CO, but only 29.8% (n = 14) reported participating in case conferences and tumor board with oncologists.

Global cardio-oncological or cardiovascular risk assessment is always performed before starting treatment in 13 centers (27.7%), sometimes performed in 25 (53.2%), rarely performed in 6 (12.8%), and is never performed in 3 (6.4%). In line with these data, 18 centers (35.3%) always refer patients who are going to start potentially cardiotoxic treatment to Cardiology, 24 (47.1%) do so sometimes, 5 (9.8%) rarely do so, and 4 (7.8%) never refer patients to Cardiology. The reasons for referral are presence of cardiovascular risk factors in 8.9% (n = 4) of the cases, history of cardiovascular disease in 26.7% (n = 12), history of cancer in 2% (n = 1) and type of cancer therapy planned in 55.6% (n = 25) of the cases.

Table 1 shows the most common tumors treated in the institutions.

Diagnosis

Ventricular function is evaluated by echocardiography in all the patients before starting treatment in 22 centers (43.1%) and only in some patients in 29 (56.9%) centers. During follow-up, echocardiography is indicated according to the treatment regimen used in 64.7% (n = 33) while 35.3% (n = 18) indicated it according to patients' outcome. Cardiovascular assessment and monitoring are based on guidelines and recommendations of scientific societies in 72.5% (n=37) of the institutions, while 5.9% (n=3) follow institutional protocols, and in 21.6% (n =11) each professional makes decisions based on his/her own criteria. Most centers follow the recommendations of the Consensus Statement of the Argentine Society of Cardiology (n = 28, 75.7%), and those of the

Table 1. Most common tumors

Type of cancer	n
Breast	49
Leukemias-Lymphomas	35
Colorectal	33
Kidney	31
Lung	30
Prostate	25
Cervical	20
Pancreatic	18
Melanoma	18
Gastric	15
Sarcomas	12
Others	5

American Society of Oncology or European Society of Oncology (n = 24, 64.9%), the European Society of Cardiology (21, 56.8%) and the American Society of Echocardiography (n = 15, 40.5%) (Figure 2).

All the centers evaluate left ventricular ejection fraction with echocardiography; 68.1% (n = 32) use two-dimensional echocardiography, 12.8% (n = 6) use three-dimensional echocardiography and 19.1% (n = 9) use both methods. Thirty centers (63.8%) evaluate global longitudinal systolic strain. Only 47.1% (n = 24) indicate cardiac magnetic resonance imaging to some patients, while the rest of the centers never indicate it. Cardiac computed tomography scan is indicated in some patients in 35.3% of the centers, and 64.7% never do so.

Biomarkers are measured in all the patients in only 4 centers (7.8%), in some patients in 29 (56.9%), while 17 centers (33.3%) never measure biomarkers. Troponin is the biomarker most used (70%).

Chemotherapy

Table 2 shows the most common cancer treatments indicated.

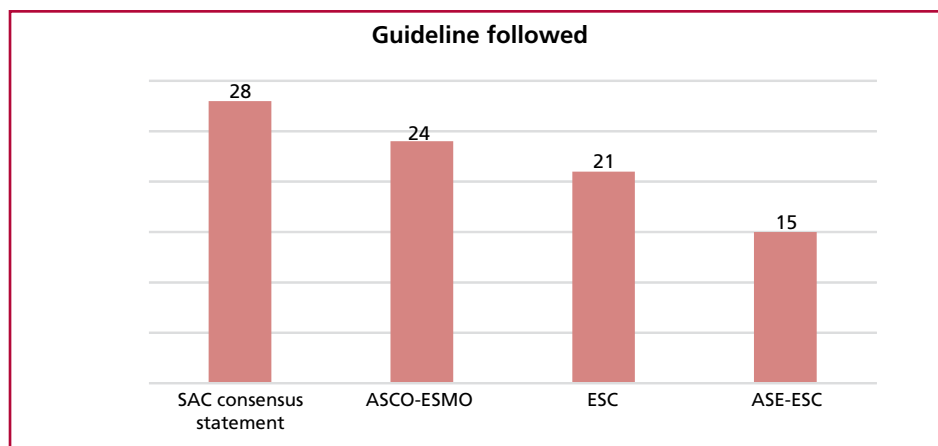


Fig. 2. SAC: Sociedad Argentina de Cardiología
 ASCO: American Society of Clinical Oncology
 ESMO: European Society of Medical Oncology
 ASE: American Society of Echocardiography
 ESC: European Society of Cardiology

Table 2. Cancer treatments

Treatment	n
Anthracyclines	50
TKI	46
Anti-angiogenic agents	45
Taxanes	44
Anti-Her2 antibodies	44
Hormone therapy	41
Immunotherapy	39
Proteasome inhibitors	26
RAF-MEK inhibitors	26

Primary prevention of cardiotoxicity with neurohormonal antagonist drugs is always indicated in 5.9% (n = 3) of the centers; almost always in 39.2% (n = 20), never in 35.3% (n = 18), and 17.6% (n = 9) do not know. Dexrazoxane is used in only 5.9% (n = 3) of the centers and liposomal anthracycline in 74.5% (n = 38); the lack of use is due to high costs (30.8%), lack of medical coverage (23.1%) or absence of indication (46.2%).

If cardiotoxicity develops, 39 centers (76,5) indicate cardioprotection, 41% (n=21) discontinue chemotherapy and 47% (n=24) modify the regimen; 76% (n=39) base their decision on oncology criteria, and 4% (n=2) continue with the same regimen until the end of treatment.

Radiation therapy

Only 11 institutions (21.6%) count with radiotherapy services. Patients have access to three-dimensional radiotherapy in 81.8% of cases, IMRT in 45% and cobalt therapy in 18% (2). In case of requiring high-precision radiotherapy, 39% (n = 20) refer their patients to other centers, 49% refer only patients with social security coverage and 12% do not do so. For patients undergoing radiotherapy to the thorax, neck or abdomen and pelvis, follow-up is always performed in 36%, sometimes in 36% and rarely or never in 28%.

DISCUSSION

Here we present the first national registry of CO, which provides information and a current outlook of the current situation of this subspecialty in our country. At the same time, we have not found any records like this one in our bibliographic search performed in the main indexed publications worldwide with the aim of providing a profile of the centers and how they work.

When we evaluated the status of CO services and their usual practices, we found that 51 centers consider they work organically in CO, with different levels of complexity and organization. However, only 49% consider that their organization follows the recommendations made by the guidelines and consensus statements. Like in many other aspects not only relat-

ed with healthcare, there is a strong concentration of centers in the Autonomous City of Buenos Aires and in the Province of Buenos Aires (Figure 1), with only 18% of centers in the rest of the country to treat a population of 26 376 018 of the total 47 327 407 inhabitants in our country according to statistics obtained from the 2022 census. (28)

The proportion of public institutions versus social security and private centers is uniform (47.1% vs. 52.9%), even though only 37% of our population is treated in national, provincial, and municipal public institutions; 51% attends the social security sector and 12% is treated in private institutions. (29) It is worth mentioning that part of the population with social security coverage frequently uses public sub-sector facilities.

Most CO services are provided by general hospitals as there are only a few cancer centers. Although these highly specialized cancer centers may constitute the pinnacle for managing these patients, most cancer treatments and follow-up of survivors take place in general hospitals with lower patient volumes. This slows down the professionals' learning curve and may lead to lower detection of complications.

Most centers have more cardiologists than oncologists and hematologists. Although most cardiologists participate in scientific activities and CO courses, only 29.8% attend case conferences and tumor boards together with oncologists, an activity that we consider of utmost importance not only for a better joint management of patients but also to consolidate medical work groups.

Since prevention of cardiovascular complications is one of the main aspects of CO, it is surprising that only 27.7% perform global risk stratification before initiating treatment in all the patients, while baseline risk is sometimes or never assessed in the rest. The most common reasons for referring patients for preventive cardio-oncology are the therapeutic scheme planned (55.6%) and a history of cardiovascular disease (26.7%).

The distribution of tumors treated in the institutions is within the usual range (Table 2), with breast cancer, hematologic cancer and colorectal cancer leading the statistics. (30)

Diagnosis and follow-up

Measurement of ejection fraction by two-dimensional echocardiography is the technique most widely used for the evaluation of ventricular function; global systolic longitudinal strain is also widely used, followed by cardiac magnetic resonance imaging and computed tomography scan. As we can see, despite the healthcare access is difficult for a large percentage of the population, a stepwise multimodality imaging approach is gaining ground in our country, in line with international practices. (31)

Despite the use of biomarkers for diagnosis and monitoring has increased, the rate of use in our sur-

vey is very low (7.8%) (15-32). Troponin was the biomarker most used, but its implementation should be further encouraged in the future.

Only 43.1% assessed ventricular function before initiating treatment in all the patients. During follow up, most institutions (72.5%) follow the recommendations of the scientific societies for monitoring. The Consensus Statement of the Argentine Society of Cardiology (9) is followed by most centers (75.7%).

Treatment

Among cancer treatments, anthracyclines are still widely used, followed by all the treatments that have improved survival and disease-free survival in recent years, such as small-molecule kinase inhibitors, anti-Her2 antibodies, anti-angiogenic agents, proteasome inhibitors and immunotherapy, among others. All these therapies are in line with treatment standards but have well-known cardiovascular adverse effects. (33)

Primary prevention with neurohormonal antagonists to prevent remodeling is used in a significant proportion of the population; liposomal anthracyclines are also used. On the contrary, the use of dexrazoxane is below the current recommendations. (34) Again, health coverage is the main limitation.

When cardiotoxicity develops, most physicians initiate cardioprotective treatment; however, almost a quarter of the centers do not indicate cardioprotection, which indicates failure in the treatment system. For most centers, cardiotoxicity results in discontinuation or modification of chemotherapy, mostly based on oncology criteria (76%).

Radiation therapy

In the 11 centers surveyed, most patients have access to three-dimensional radiotherapy and IMRT. Nevertheless, cobalt therapy is still used in 18% of the patients. In a survey of European centers conducted in 2014, only 3% (77) of the centers were still using cobalt therapy distributed across 27 low-income countries in Eastern and Southern Europe. There is a clear relationship between income per capita and the availability and quality of radiotherapy equipment. (35)

STUDY LIMITATIONS

The registry was carried out by contacting the professionals belonging to medical institutions included in the database of the professionals who regularly participate in cardio-oncology activities in our country. Although we believe we have included most institutions, some could have been left aside or could have declined to participate.

CONCLUSIONS

Since the publication of the first Consensus Statement on Cardio-Oncology of the Argentine Society of Cardiology in 2013, when cardiologists, oncologists, hematologists and radiotherapists met for the first time

and started working together, cardio-oncology has experienced a remarkable growth both nationwide and worldwide. Our publication reflects this growth, provides valuable information on the current situation, points out the successes achieved in diagnosis and treatment and clearly exposes the areas in which we still need to work to improve education, spread best practices and take action to achieve better and more efficient public and private health institutions.

Conflicts of interest

None declared.

(See authors' conflict of interests forms on the web/Additional material.)

Interest

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OBELISCO-SAC Registry

This survey was organized by the Council on Cardio-Oncology of the SAC. We appreciate your participation

DATA OF THE PHYSICIAN RESPONDING THE SURVEY

Your institution is: _____ Specialty: _____ Province/city: _____

Type of institution: _____

Do you consider your institution counts with cardio-oncology services? (Complying with the recommendations of international guidelines and on and with the consensus statement on cardio-oncology of the SAC)	<input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Do not know
In your institution, do the professionals participate in courses and scientific activities related with cardio-oncology?	<input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Do not know
Do cardiologists participate in case conferences and tumor board with oncologists?	<input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Do not know
Do you perform global cardio-oncological or cardiovascular risk Never assessment before starting cancer treatment?	<input type="radio"/> Rarely <input type="radio"/> Sometimes <input type="radio"/> Always
Approximately how many oncologists/hematologists are there in your institution?	<input type="radio"/> 0 <input type="radio"/> 1-5 <input type="radio"/> 6-10 <input type="radio"/> 11-15 <input type="radio"/> > 15
Approximately how many cardiologists are there in your institution?	<input type="radio"/> 0 <input type="radio"/> 1-5 <input type="radio"/> 6-10 <input type="radio"/> 11-15 <input type="radio"/> > 15
In your center, are cancer patients referred to cardiology for evaluation before a potentially cardiotoxic treatment?	<input type="radio"/> Never <input type="radio"/> Rarely <input type="radio"/> Sometimes <input type="radio"/> Always
Which are the reasons to refer patients to cardiology?	<input type="radio"/> Cardiovascular risk factors <input type="radio"/> History of cardiovascular disease <input type="radio"/> History of cancer <input type="radio"/> Type of cancer therapy planned <input type="radio"/> Do not know
Which is/are the most common tumor/s treated in your center? (Can choose several options)	<input type="radio"/> Breast cancer <input type="radio"/> Colorectal cancer <input type="radio"/> Pancreatic cancer <input type="radio"/> Gastric cancer cancer <input type="radio"/> Kidney cancer <input type="radio"/> Leukemia/lymphoma <input type="radio"/> Sarcomas <input type="radio"/> Prostate cancer Melanoma <input type="radio"/> Cervical cancer <input type="radio"/> Other
Does your institution count with radiotherapy services?	<input type="radio"/> Yes <input type="radio"/> No
Which type or radiotherapy can your patients access?	<input type="radio"/> 3DRT <input type="radio"/> IMRT <input type="radio"/> Cobalt therapy

Does your institution refer patients to centers with high precision radiotherapy capabilities?	<input type="radio"/> No <input type="radio"/> Yes <input type="radio"/> Depends on the social security coverage
Does your center follow-up patients undergoing radiotherapy to the thorax, neck or abdomen and pelvis?	<input type="radio"/> Never <input type="radio"/> Rarely <input type="radio"/> Sometimes <input type="radio"/> Always
Which of the following treatments are indicated in your institution? (Can choose several options)	<input type="radio"/> Anthracyclines <input type="radio"/> TKIs <input type="radio"/> Anti-angiogenic agents (VEGF) <input type="radio"/> Hormone therapy <input type="radio"/> Taxanes: paclitaxel <input type="radio"/> Anti-Her2 antibodies <input type="radio"/> Immunotherapy <input type="radio"/> Proteasome inhibitors (PIs) and immunomodulators (IMiDs) <input type="radio"/> Combined RAF-MEK inhibitors: vemurafenib + cobimetinib, dabrafenib + trametinib, encorafenib + binimetinib
In your center, which imaging test is more commonly used to evaluate left ventricular function?	<input type="radio"/> LV ejection fraction echocardiography <input type="radio"/> LV ejection fraction nuclear medicine images <input type="radio"/> LV ejection fraction cardiac MRI <input type="radio"/> Other method
How many patients undergo echocardiography to evaluate ventricular function before starting treatment?	<input type="radio"/> All <input type="radio"/> Some <input type="radio"/> None
The echocardiography laboratory in your institution	<input type="radio"/> Evaluates LVEF by 2D echocardiography <input type="radio"/> Evaluates LVEF by 3D echocardiography <input type="radio"/> Uses 2D and 3D echocardiography <input type="radio"/> Analyzes strain
How many patients are referred to cardiac magnetic resonance imaging to evaluate ventricular function?	<input type="radio"/> All <input type="radio"/> Some <input type="radio"/> None
How many echocardiograms per year are performed to cancer patients during follow-up?	<input type="radio"/> Only 1 <input type="radio"/> Depends on patient progress <input type="radio"/> Depends on the therapeutic regimen <input type="radio"/> None
How many patients are referred to cardiac CT scan per year to evaluate cardiotoxic effects?	<input type="radio"/> All <input type="radio"/> Some <input type="radio"/> None
How many patients are monitored with cardiac biomarkers?	<input type="radio"/> All <input type="radio"/> Some <input type="radio"/> None
Which is the biomarker you most commonly use?	<input type="radio"/> Troponin <input type="radio"/> BNP-Pro BNP <input type="radio"/> Others
Cardiovascular evaluation and monitoring of cancer patients is performed:	<input type="radio"/> Following guidelines/recommendations/position statements of scientific societies <input type="radio"/> Following institutional protocols <input type="radio"/> Do not know
Of which scientific societies?	<input type="radio"/> ASCO/ESMO <input type="radio"/> SAC consensus statement <input type="radio"/> European Society of Cardiology <input type="radio"/> Recommendations of ASE/ESC <input type="radio"/> Others

DO you indicate cardioprotection in primary prevention? (ACE inhibitors, beta blockers, aldosterone antagonists)	<input type="radio"/> Always <input type="radio"/> Almost always <input type="radio"/> Never <input type="radio"/> I do not know
Do you use dexrazoxane?	<input type="radio"/> Yes <input type="radio"/> No
Do you use liposomal anthracycline?	<input type="radio"/> Yes <input type="radio"/> No
Why is cardioprotection with liposomal anthracycline not indicated?	<input type="radio"/> Due to costs <input type="radio"/> They are not indicated in my center <input type="radio"/> Due to lack of medical coverage <input type="radio"/> Due to intolerance <input type="radio"/> Does not have any indication in the cases usually seen
How do you manage a case of cardiotoxicity in your center? (Can choose several options)	<input type="radio"/> Chemotherapy is discontinued <input type="radio"/> Chemotherapy is modified <input type="radio"/> We Continue with the same regimen until the end of treatment <input type="radio"/> Cardioprotective treatment <input type="radio"/> Depends on cancer status Other
How often are your patients monitored?	<input type="radio"/> Every three months <input type="radio"/> At baseline and after treatment ends <input type="radio"/> Only if complications develop <input type="radio"/> Depends on cancer therapy indicated <input type="radio"/> Do not know