CorSalud 2015 Jan-Mar;7(1):89-100

CorSalud

Cuban Society of Cardiology

Letters to the Editor

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Cardiocentro Ernesto Che Guevara Santa Clara Cuba

Outcome of stent thrombosis following second- versus first-generation drug-eluting stents: it is time to SORT OUT!

Resultado de la trombosis del stent entre stents liberadores de fármacos de segunda y primera generación: ¡Es el momento de aclarar!

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Received: December 20, 2014
Accepted: January 07, 2015

Key words: SORT OUT IV, stent thrombosis, drug-eluting stents, everolimus, sirolimus

Palabras clave: SORT OUT IV, trombosis del *stent*, *stent* liberadores de fármacos, everolimus, sirolimus

To the Editor:

With full interest, we read the article "2-Year Patient-Related Versus Stent-Related Outcomes: The SORT OUT IV (Scandinavian Organization for Randomized Trials With Clinical Outcome IV) Trial" by Jensen *et al.*[1]. A pretty interesting point highlighted by the authors was the discrimination of device-specific 'stent-related' outcome versus the broad-based 'patient-oriented' outcome that naturally encompasses many events unrelated to the index procedure (or device), such as non-target lesion revascularization and non-target vessel-related myocardial infarction. In the current report, nearly two-thirds of the patient-oriented outcome was unrelated to the index device in either stent arm, comparative to nearly half that outcome similarly unrelated to the index stent in a 2-year follow-up report of the RESOLUTE All-Comers trial[2]. The authors concluded that "The everolimus-eluting stent (EES) was found to be noninferior to the sirolimus-eluting stent (SES) for patients treated with percutaneous coronary intervention, accompanied by a lower rate of definite stent thrombosis"[1].

Nevertheless, a closer look at the rates of occurrence (and clinical presentation) of stent thrombosis (ST) in the two stent arms would raise the following concern. Although the rate of definite ST (with the strict definition that essentially needs angiographic or autopsy confirmation) at 2-year follow-up was lower with EES versus SES (Hazard Ratio HR 0.23); yet, the rate of probable ST (with the more sensitive but less specific definition) at the same time point was higher with EES (HR 1.74); the rate of possible ST (with the further broad definition) at 2 years was similarly higher with EES (HR 1.83).

Given that all cases presenting with acute ischemia in the territory of the index stent underwent early coronary angiography (as already acknowledged by the authors), cases of probable, and possible ST must had all presented by unexplained cardiac death in the first 30 days, and beyond 30 days, respectively, according to the definitions of the Academic Research Consortium[3]. This might bear some relation to the higher cardiac death rate at 2-year follow-up observed with EES versus SES (HR 1.24). Moreover, analysis of the clinical scenario that followed the event of ST (table 4[1]) revealed that all cases that developed definite ST presented with acute myocardial infarction, whereas all cases of probable ST presented with cardiac death.

In this respect, it was notable that during the first year of follow-up, 7 out of 9 cases of definite or probable ST (77.8%) in the EES arm died out of the event, as compared with only 4 out of 13 cases of definite or probable ST (30.8%) in the SES arm. Speculatively, with lack of autopsy examination, cases that died out of ST were not confirmed, and hence, were classified as 'probable' or 'possible ST, according to the timing of occurrence, rather than "definite" ST.

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Meeting of the Central Network of Cardiology and Cardiac Surgery

Reunión de la Red Cardio-Quirúrgica Central

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Cardiocentro Ernesto Che Guevara, Villa Clara, Cuba; and Cuban Central Network of Cardiology and Cardiac Surgery

Received: January 31, 2015
Accepted: January 05, 2015

Key words: Meeting, Health network, Health administration, Cardiology, Heart surgery
Palabras clave: Reunión, Red de Salud, Gestión de salud, Cardiología, Cirugía cardíaca

To the Editor:

The Scientific-Methodological Meeting of the Central Network of Cardiology and Cardiac Surgery (**Figure**), for the first half of 2015, was held at the Conference Hall of the Arcoiris Leisure Complex in the city of Santa Clara on January 29 and 30, 2015.

Dr. Jesús A. Satorre Ygualada officially welcomed the participants, and thanked the presence of the National Director of Drugs and Medical Technologies and the Head of Department of Pharmaceutical Services, both from the Ministry of Public Health, as well as the participation of provincial executives. He also highlighted the work of the Diagnostic Centers for their very important contribution to the successes achieved by the Cardiocentro Ernesto Che Guevara.

Dr. Raúl Fernández Dueñas spoke of the history of the Central Network of Cardiology and Cardiac Surgery, a name given by the Commander in Chief Fidel Castro Ruz on the occasion of an analysis made in 2003 with the aim of achieving equal development in Cardiology throughout the country, and talked about other topics of general interest.

This network provide services to a population of approximately 2.9 million inhabitants in the provinces of Camaguey, Ciego de Avila, Sancti Spiritus, Cienfuegos and Villa Clara[1], and also any citizen anywhere in the country who may want to be treated in this institution.

The Cardiocentro Ernesto Che Guevara, the only hospital in Cuba featuring Cardiac and Vascular Surgery Services[2], with a historical surgical survival rate of

Figure. A. Plenary session. **B.** Some of the members of the Central Network of Cardiology and Cardiac Surgery.

more than 95%, will celebrate its thirtieth anniversary in 2016. Dr. Dueñas announced the upcoming celebrations.

Subsequently, the main difficulties faced and the strategies for work in the coming months were discussed. The need of working together for the good of society was emphasized, as there is an increase in morbidity and mortality rates from heart disease every year in this region of country[3] and therefore each province must strive for better conditions to prevent, diagnose and adequately treat these diseases.

Once the director ended his speech, each of the representatives of the Diagnostic Centers explained in detail their working conditions and pressing needs.

There was a general consensus on:

a) The idea that communication is very important, so that the computer network plays an important role in the healthcare and continuous monitoring of patients, to get their return to the community. In this regard, it was discussed the usefulness of telemedicine, especially for the transmission of images (echocardiograms, CT scans and angiograms) from the Cardiocentro Ernesto Che Guevara towards the Diagnostic Centers and vice versa.
b) The importance of cardiovascular rehabilitation.
c) The need to plan the training of the whole network, and work on improving the equipment and the sustainability of quality services for the people.

Dr. Emilio Delgado Iznaga was pleased to participate in this meeting and learn about the history of the Cardiocentro and its so beautiful and necessary integration with the Central Network of Cardiology and Cardiac Surgery. He also expressed that the National Health System is proud to have a fully integrated subsystem as ours.

Finally, Dr. Satorre gave an overview of the meeting and promoted Cardiovilla 2015, the conference of the cardiology family in the Central Region, to be held from October 8 to 10, 2015.

There was satisfaction with the accomplishments; and the planning of strategies for future work included the following resolutions:

1. Strengthen the integration of the Central Network of Cardiology and Cardiac Surgery through effective organizational communication, monthly scheduled visits, training, and identification of learning needs, among others.
2. Sign, in ceremony at each hospital, the new agreement for territorial integration, which takes into account the aspects that are common in the network and the peculiarities of each province.
3. Perform specific work weeks for each province in order to reduce the waiting list, depending on the sustainability of supplies.

4. Support major vascular surgery in the provinces through the advice of experts from the Cardiocentro, and through the training, in this hospital, of specialists appointed by the Diagnostic Centers.
5. Discuss, in the scientific committees and board meetings of each hospital, the action protocols for seriously ill cardiac patients in need of mechanical ventilation.
6. Request the necessary equipment and supplies, taking into account the current and future projections, for a proper development of cardiac healthcare in each territory.
7. Analyze, in conjunction with the Provincial Health Office, the community outreach of the specialty, according to the needs and availability of human resources.
8. Strengthen the research work and the joint work with Medical Universities about the learning needs and postgraduate courses, together with the Cardiocentro of Villa Clara.

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Appendix. Participants.

Members of the Central Network of Cardiology and Cardiac Surgery, who participate in the meeting, according to their provinces and hospitals

- Cardiocentro "Ernesto Che Guevara" (Centro Rector): MSc. Dr. Raúl Dueñas Fernández (Director General), MSc. Dr. Jesús A. Satorre Ygualada (Vicedirector Primero y Presidente del Capítulo de Villa Clara de la Sociedad Cubana de Cardiología), MSc. Dr. Orlando de la C. Marchena Moré (Jefe de Logística Médica), MSc. Dra. Nérida Rodríguez Oliva (Jefa del Departamento de Epidemiología Hospitalaria), MSc. Dr. Rosendo Ibargollín Hernández (Vicedirector de Cardiología Intervencionista), Dr. Rubén T. Moro Rodríguez (Jefe de Servicio de Cirugía Vascular), Dr. Francisco L. Moreno Martínez (Editor Jefe de la Revista CorSalud), Dra. Ana María Correa (Laboratorio Clínico), Dr. Luis M. Reyes Hernández (Cardiólogo).
- Hospital "Arnaldo Milián Castro" (Villa Clara): Dr. Casimiro Montero Hernández (Cardiólogo).
- Hospital "Celestino Hernández Robau" (Villa Clara): Dr. Luis A. Rodríguez López (Jefe de Servicio de Cardiología).
- Hospital "Gustavo Aldereguía Lima" (Cienfuegos): Dr. Yanier Coll Muñoz (Director Médico), Dr. Brandy Viera Valdés (Jefe de Servicio de Cardiología).
- Hospital "Camilo Cienfuegos" (Sancti Spíritus): Dr. Manuel Lage Meneses (Jefe de Servicio de Cardiología), Dr. Alexander Santos Pérez (Cardiólogo).
- Hospital "Antonio Luaces Iraola" (Ciego de Ávila): Dr. Roberto Melo Sánchez (Jefe de Servicio de Cardiología).
- Hospital "Roberto Rodríguez Fernández" (Morón, Ciego de Ávila): Dr. Leonel Hernández Cruz (Jefe de Servicio de Cardiología).
- Cardiocentro del Hospital "Manuel Ascunce Domenech" (Camagüey): Dra. Elizabeth Sellén Sanchén (Jefa del Grupo Provincial de Cardiología), Dr. Ángel E. Miranda Fragoso (Jefe de Servicio de Cardiología).

Guests

- Dr. Emilio Delgado Iznaga (Director Nacional de Medicamentos y Tecnologías Médicas, Ministerio de Salud Pública - Nivel Central).
- Lic. Mailin Beltrán Delgado (Jefa de Departamento Servicios Farmacéuticos, Ministerio de Salud Pública - Nivel Central).
- Dr. Justo Rodríguez López (Vicedirector de Salud -

Asistencia Médica, Dirección Provincial de Salud de Villa Clara).

- Dr. Alexander Martínez Pérez (Jefe de Departamento de Urgencias Médicas, Dirección Provincial de Salud de Villa Clara).

Proarrhythmia: A phenomenon which the clinician who prescribes antiarrhythmic drugs must identify

Proarritmia: Un fenómeno a identificar, responsabilidad del clínico que prescribe fármacos antiarrítmicos

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Received: August 05, 2014
Accepted: September 09, 2014

Key words: Electrical alternans, ST alternans, Propafenone, Risk
Palabras clave: Alternancia eléctrica, Alternancia del ST, Propafenona, Riesgo

To the Editor:

The basic interpretation of electrophysiological phenomena in different clinical and therapeutic contexts, with antiarrhythmic drugs and others, has led researchers to try to understand and interpret the movement of ions and the alterations of their channels in the membrane of the cardiac myocyte. This has led to the identification of risks in different phenotypic ex-pressions in the electrocardiogram.

We have carefully read the article by Rizo Rivera[1], which demonstrates, in one patient, two phenomena (alternation of the ST segment and occurrence of a Brugada pattern) induced by a dose of 600 milligrams of propafenone, which was administered for the pharmacologic cardioversion of an episode of atrial fibrillation.

The mechanisms of alternation of the ST segment have been succinctly described by Rizo Rivera[1]. Thus it is not necessary to go deeper into the subject. However, it is important to remember that there are common clinical conditions that cause the elevation and alternation of the ST segment, which must lead us to think about the risk of malignant ventricular arrhythmias. Therefore, the clinical cardiologist should always be alert. Acute ischemic heart disease may be one of these conditions, in which the current hypothesis of the mechanisms causing the ST segment elevation is well explained[2]. The risk of sudden death is increased in patients with acute ischemic heart disease, which show greater heterogeneity due to regional changes in ventricular repolarization, and is evident with T-wave alternans and the occurrence of malignant ventricular arrhythmias that threaten the patient's life[3].

The search of wrong patterns, in the membranes or in the channels, leading to the appearance of Brugada syndrome still continues, increasing knowledge. There are thirteen genetic alterations that can cause this electrocardiographic pattern, which is well known for its association with sudden death[4]. It is considered that the occurrence of this pattern, by chance, in patients who are receiving a class IC antiarrhythmic drug,

should be monitored by the clinical cardiologist, as it may be the result of genetic alterations that may lead to clinical changes later in life[5].

It is not our aim to explain the electrophysiological alterations that are related to changes in ventricular repolarization and can lead to sudden death, as they are well explained in the references used in this letter. Our goal is to congratulate Dr. Rizo Rivera for identifying two electrocardiographic patterns of risk in a patient with the use of a single antiarrhythmic drug, and at the same time to call for the appropriate use of these drugs; and once it is necessary to use them, it is important to conduct an electrocardiographic monitoring with the subsequent measurement of each wave, segment and interval of the electrocardiogram, and interpret changes that may occur in them, as they are an indication of the patient's predisposition to potential arrhythmic risks.

Knowledge of the physiology of cardiac depolarization and repolarization, pharmacokinetics and adverse effects of antiarrhythmic drugs allow us to use them properly. These electrocardiographic phenomena, secondary to the use of these drugs, as Rizo Rivera[1] states, may occur with the use of class IC antiarrhythmics. Therefore, it is vital to know the water-electrolyte status of the patient, because electrolyte disturbances may produce pronounced electrocardiographic changes and the emergence of serious arrhythmias[6]. It is the responsibility of the clinician who prescribes these drugs to protect their patients.

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New methodological strategy to develop predictive indexes in primary health care and its impact on the specialty of cardiology

Nueva estrategia metodológica para desarrollar índices predictivos en la atención primaria de salud y su impacto en la especialidad de Cardiología

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Received: December 05, 2014
Updated: January 14, 2015
Accepted: January 27, 2015

Key words: Statistical model, Classification, Statistical classification methods, Predictive model, Primary Health Care
Palabras clave: Modelo estadístico, Clasificación, Métodos estadísticos de clasificación, Modelo predictivo, Atención Primaria de Salud

To the Editor:

In Public Health, classifying means to segment the population into different subgroups in which its members share common characteristics that influence a particular health-related behavior. To perform this task, there are tools which are just mathematical models containing characteristics or variables that have been found to be associated with certain event. On this basis, the probability that in similar situations this event may occur is calculated. These models, which in health are called predictive indexes, are applicable to population groups in order to identify individuals who meet certain criteria and to implement specific health actions.

They are very useful in healthcare, especially in preventive cardiology and many other specialties. For example, they may be useful in the planning of resources, helping to identify persons requiring certain health services; moreover, they can focus preventive interventions to subjects with a relatively high risk of having or developing a disease.

Therefore, predictive indexes are useful tools to support decision-making in this sector. This makes biostatisticians to pay special attention to the development of methods for solving classification problems.

Traditionally, these problems have been solved using different statistical techniques, but sometimes without taking into account the feasibility of the models obtained, in terms of simplicity and being easily understood by decision makers, who are the people who help in the process of model building and have the responsibility to accept it, or not, for implementation. Therefore, their responsibility, in making the final decision, compels them to understand the general features of the methodology used, and the quality of the results of its implementation.

These instruments, besides having a practical justification, that is, to measure an important result, should be easy to use and understand[1].

In Villa Clara, a new methodological strategy has been tested for the development of predictive indexes in different situations linked to Health Sciences[2,3], and very good results have been obtained.

This new methodology is based on the characteristics of the Cramer's V statistic, a coefficient of association for nominal variables, which indicates the strength of association. So, when there is a classification problem involving a group of factors that are associated with certain response variable, such as "the risk of disease", it provides a good estimate of the contribution of each variable to this result[4]. The values of this statistic vary between 0 and 1, expressing a strongest association the closer they are to the unit[5-7]. Therefore, they can be used in a comparative way to establish the contribution of each variable to the response or multivariate classification.

For example, since cardiovascular disease is a major cause of morbidity and mortality in Cuba and in developed countries, the development of predictive risk models for these diseases is of particular interest to try to understand the possible mechanisms influencing the increased risk, and to intervene early, through preventive campaigns and, if necessary, with therapeutic measures[8].

Thus in the field of cardiovascular risk models, knowledge of the factors that influence an event of this type, as well as the magnitude of that influence, will help implementing preventive or therapeutic measures.

Moreover, the values of Cramer's V can be additively used to establish the criterion of "maximum contribution" and consequently, the portion presented by each case with the combination of contributing variables. That is, the sum of the values of this statistic, calculated for the variables that have been identified as associated with the episode of interest (let us suppose it is "the risk of coronary heart disease"), will provide the maximum risk that patients from that population have of presenting such episode. This value is useful for comparisons between individual risks (when calculated with the variables present in each individual) and more importantly, between individual risk and maximum risk. Thus, each patient may be classified into one of the preset groups, such as "low risk" and "high risk", after identifying a value that defines whether the response variable (cutoff) belongs to one or another group.

With the values that are predicted by the model, receiver operating characteristic curves may be built in order to determine its discrimination capacity and compare it with other probabilistic classifiers.

The results concerning the discrimination of the models that were obtained by this methodology have been equal or superior to other models which are based on more complex methods, such as logistic regression and discriminant analysis.

However, it is advisable that the available methods are implemented in each classification problem, to select the one that shows a better performance, taking into account its feasibility and understanding by decision makers.

Professionals today must assume a scientifically critical position regarding health technologies in general and mathematical models in particular, which must be used with extreme caution and intelligence[9], because they are transient models, subject to verification and improvement[8].

In this sense, the development of a simple statistical methodology, besides being useful for the creation of local models, may facilitate the necessary assessment of the existing ones.

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Respiratory physical therapy: an additional care for patients who undergo heart surgery

La fisioterapia respiratoria, un cuidado más en el paciente operado del corazón

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Received: June 06, 2014
Accepted: July 15, 2014

Key words: Cardiac rehabilitation, Cardiac surgery, Respiratory physiotherapy, Nursing
Palabras clave: Rehabilitación cardíaca, Cirugía cardíaca, Fisioterapia respiratoria, Enfermería

To the Editor:

We read with great interest the article by Hernández *et al*[1] about cardiac rehabilitation in cardiovascular surgery, which was published in this journal, and due to the importance of the subject we felt encouraged to share our experience.

Respiratory physical therapy (RPT) is a subspecialty of Physical therapy intended for the prevention, treatment and stabilization of respiratory dysfunctions or disorders, whose overall objective is to improve regional lung ventilation, gas exchange, the function of respiratory muscles, dyspnea, exercise tolerance and the quality of life related to health[2]. It consists of a series of specialized techniques and procedures of functional diagnostic assessment of the respiratory system, as well as therapeutic intervention techniques for unblocking airways, respiratory reeducation and readjustment to effort.

In the Postoperative Intensive Care Unit of the Cardiocentro Ernesto Che Guevara, since 2000, a new era began in the nursing care of patients who underwent cardiac surgery. Our management group, created in April 1999, prepared a manual on "Nursing Actions in Cardiac Surgery", which included a series of very important health care procedures such as RPT techniques.

Definition

RPT is the set of techniques intended for improving the respiratory dynamics of the patient, in this case the patient who underwent cardiac surgery. The term physical therapy refers to the use of natural forces, light, heat, air, water, exercise, among others, in the treatment of diseases[3-5].

The use of RPT should be aimed at two aspects: prophylactic and therapeutic aspects. In patients who need heart surgery, the learning phase before surgery is very important. This phase is programmed in advance, so a more efficient collaboration is achieved, allowing a training period for a proper performance in the postoperative period[6,7].

Following the withdrawal of mechanical ventilation, the RPT becomes a key aspect of the health care procedures, since respiratory complications are common after thoracic surgery, because the respiratory dynamics is affected from the mechanical point of view. Thus, problems such as atelectasis and inflammatory lung disease, among others, may occur due to bronchial obstruction resulting from accumulation of secretions and diaphragmatic and chest wall hypomobility, which in turn are due to pain[8].

As Hernández *et al*[1] state, admission to hospital prior to surgery allows patient education. So they may collaborate afterwards in conducting passive or active exercises. In general, the RPT contributes to[7-9]:

- Relax the muscles involved in breathing.
- Eliminate uncoordinated and ineffective forms of respiratory muscle activity.
- Reduce respiratory frequency and work.
- Breathe slowly in a relaxed and rhythmic manner.
- Reduce O_2 requirements.

Inspiration through the nose allows filtration, humidification and heating of the air, so we must check the patency of the nostrils and, in case of partial or complete obstruction, carry out a thorough cleaning with saline solution[7].

On the other hand, oxygen therapy is also important in the recovery of these patients, because it keeps adequate levels of O_2 in blood to meet heart and organic needs, and prevent the consequences of hypoxemia[10].

In our unit, the following procedures are used to perform a correct RPT after extubation:

PASSIVE BREATHING EXERCISES [1,8,11]

1. Nebulization

The goal is to liquefy secretions and facilitate their expulsion. Humidified oxygen therapy is used by two systems: a) a mask (venturi mask) with a fraction of inspired oxygen (FiO_2) up to 0.5 and b) a nozzle with controls for adjusting concentration and pressure of O_2 (FiO_2 up to 99%). In these cases the continuous positive airway pressure (CPAP) –a form of noninvasive ventilation– is the most widely used technique in the RPT, with good results; also, the use of humidifiers favors humidification of secretions, for better expectoration.

2. Assisted cough

It is defined as a violent expulsion of air from the lungs in response to irritation of the respiratory tract sensory fibers. If there is no spontaneous reflex action, it has to be stimulated in order to expel the tracheobronchial secretions. It is important to stay in a proper position when coughing: head bent slightly forward, shoulders back and arms relaxed and not supported. A slow, deep breath is taken through the nose, and the air is expelled through the mouth, intermittently, in 2-3 strokes, which are repeated until getting a productive cough.

3. Percussion and vibration

They are contraindicated in the early hours of the postoperative period of cardiac surgery. It is kept for patients with lung problems, retention of copious secretions, once a reasonable period of time has passed, and depending on their precise status and outcome. The goal is to loosen secretions of peripheral bronchi and easy their movement to larger bronchi and then into the trachea. The patient should exhale slowly while a vibration is rhythmically and relatively quickly performed using the hands or a mechanical device. It should start in the base of the lungs.

4. Postural Drainage

It is the passive removal, by gravity, of bronchial secretions, from small bronchi to the larger ones, and then into the trachea. Left or right lateral decubitus positions are used, depending on the drainage needs, and the patient will remain in that position at least 10 minutes. It is necessary to avoid patient's effort and try to accompany the position with a good humidified oxygenation and cough to improve the outcome. If percussion is also used, in addition to postural drainage, the technique will be even more effective; although it must be remembered that in the early hours percussion is contraindicated.

ACTIVE BREATHING EXERCISES [1,12-13]

The exercises that are described here are those performed at the Cardiocentro Ernesto Che Guevara after cardiac surgery. There are a number of premises that must be taken into account: the position of the patient should be adequate, ideally he should be seated; the explanation and orders should be simple, accompanied by demonstrations; and if the patient has ingested food, it is necessary to wait at least an hour and a half before starting the exercises.

1- Breathing exercises against resistance

After the abdominal or thoracic surgery, normal, deep, spontaneous and automatic breathing is replaced with a shallow breathing, in an effort to reduce pain. This causes the accumulation of secretions. This type of exercises favors the recovery of a normal breathing pattern and prevents complications.

a) **Filling a bag:** The patient is given a rubber bag or glove that is attached to a length of rubber (nozzle) in order to blow air into it, gradually and intermittently.

b) **Set of Balls:** A system consisting of a nozzle connected to a set of balls, each in a canal, three in number, and each ball represents an increasing inspiratory effort, that is, more difficult inspiration. The patient is instructed to place the nozzle of the system into his mouth and breathe through it, and try, first, to raise

the first ball of the system, until raising the third.

2- Encouraged cough and expectoration

The patient is instructed how to cough and expectorate, according to the previously explained procedure, to carry it out actively.

3- Other exercises and techniques

a) **Thoracic or costal breathing:** In a semi-sitting supine position, with the head resting, hands on the bottom ribs, at axillary level, and pressing down slightly, the patient is told to take deep breaths, while exerting limited pressure. Later this pressure is accentuated to facilitate complete exhalation.

b) **Diaphragmatic or abdominal breathing:** With the patient laying comfortably, the nurse places one of his hands in the abdominal wall to indicate the movements, depending on the patient's breathing. The abdomen relaxes during inspiration to help the descent of the diaphragm, and during exhalation it contracts to retract the abdominal wall and lift the diaphragm.

c) **Breathing with pursed lips:** The objective is to train the respiratory muscles, prolong expiration and decrease the amount of trapped air and the resistance of the airways. The patient is told to inhale through the nose and exhale slowly and evenly, with pursed lips, while the muscles contract.

d) **Incentive spirometer:** Prevents postoperative atelectasis. It is called incentive because it is possible to gradually increase the amount of air that the patient must inspire, and it encourages him to progress every day.

Nursing care, especially a correct RPT, minimize respiratory complications after cardiac surgery[7,8,13,14]. It is necessary to instruct the patient, before surgery, in the RPT techniques he will perform afterwards, in order to achieve a greater control, accuracy and effectiveness.

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