

Quality of life before and after pulmonary thromboendarterectomy: Preliminary results

PEDRO RODRIGUES GENTA, FÁBIO BISCEGLI JATENE^(TE SBCT), MÁRIO TERRA-FILHO

Background: Pulmonary hypertension secondary to chronic thromboembolism is a severe and debilitating disease and has been associated with high mortality. Pulmonary thromboendarterectomy is the treatment of choice.

Objective: To evaluate the impact of pulmonary thromboendarterectomy on the quality of life of patients with pulmonary hypertension secondary to chronic thromboembolism using the SF-36 Health Survey.

Method: The SF-36 Health Survey questionnaire was administered to 13 patients prior to and at least 3 months following thromboendarterectomy.

Results: Of the 13 patients studied, 7 were female and 6 were male. Mean age was 45.7 ± 18.3 . All were submitted to thromboendarterectomy. After surgery, all SF-36 domains, with the exception of the "mental health" domain, improved.

Conclusion: Pulmonary thromboendarterectomy provides significant improvement in patient quality of life.

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*Study carried out in the Departments of Pulmonology and Thoracic Surgery of the Instituto do Coração - Hospital das Clínicas da Faculdade de Medicina da Universidade de São Paulo (InCor - HC FMUSP, Clinical Hospital Heart Institute of the University of São Paulo School of Medicine)

Correspondence to: Rua Pintassilgo, 519 apt. 80, CEP: 04514-032 - São Paulo SP. Phone #: 55-11-5093 8775.

E-mail: pnemario@incor.usp.br

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INTRODUCTION

Approximately 0.5% of patients who survive an acute episode of thromboembolism develop chronic thromboembolic pulmonary hypertension (CTEPH)⁽¹⁾, defined as persistence of pulmonary hypertension three months after a thromboembolic event⁽²⁾.

Diagnosis and management of CTEPH depend on a multidisciplinary team of pulmonologists, cardiothoracic surgeons, intensivists and radiologists. With such support, pulmonary thromboendarterectomy, which is the main form of treatment when the condition manifests as proximal thrombi in the pulmonary artery, may be performed at an acceptable surgical risk^(1,3).

The main clinical characteristic presented by CTEPH patients is persistent and progressive dyspnea, which is difficult to control. In a study carried out by our group, we observed that 92% of the CTEPH patients evaluated met the criteria for the New York Heart Association functional class III or IV, which seriously affected their quality of life⁽³⁾.

Regular followup of patients submitted to pulmonary thromboendarterectomy has revealed, in uncontrolled studies, circulatory improvement, increased exercise tolerance, better blood gas analysis values and improved carbon monoxide diffusion capacity^(4,5). Quality of life after thromboendarterectomy was evaluated in only one study⁽⁴⁾.

Quality of life questionnaires are useful for evaluating social limitation and have the merit of detecting changes in lifestyle, which cannot always be determined through the use of other traditional markers. The Medical Outcome Study (MOS) 36-item Short-Form Health Survey (SF-36) questionnaire⁽⁶⁾ is succinct, but it is comprehensive, understandable and easy to administer. It contains 10 questions regarding physical aspects, 2 regarding social aspects, 4 regarding limitations due to physical health problems, 3 regarding limitations due to emotional problems, 5 regarding mental health, 4 regarding vitality (energy/fatigue), 2 regarding pain, 5 regarding general perception of health, and 1 regarding changes in health status. The questionnaire generates eight scores ranging from 0 to 100, one for each item evaluated: functional capacity, physical aspects, pain, general health status, vitality, social aspects, emotional aspects and mental health. The questionnaire has already been translated into Portuguese and validated in Brazil⁽⁷⁾.

The objective of the present study was to evaluate the impact of pulmonary thromboendarterectomy

on the quality of life of patients with pulmonary hypertension secondary to thromboembolism using the SF-36 questionnaire.

METHODS

All patients submitted to pulmonary thromboendarterectomy between February 2000 and October 2003 were selected for inclusion in this study. The project was approved by the Ethics Committee of the *Faculdade de Medicina da Universidade de São Paulo* (FMUSP, University of São Paulo School of Medicine) *Hospital das Clínicas*.

The protocol inclusion criteria were having undergone pulmonary thromboendarterectomy and having completed the SF-36 Health Survey questionnaire twice, prior to and at least three months after surgery.

The questionnaires were administered by one of the researchers prior to thromboendarterectomy. Following surgery, the questionnaires were sent out by mail and completed by the patients themselves.

The Student's *t*-test for paired samples was used for statistical analysis of data obtained prior to and following surgery. The results were later compared with those from a group of thirteen gender- and age-matched normal individuals - employees and ex-employees of the FMUSP *Hospital das Clínicas*. The Student's *t*-test for unpaired samples was used for this analysis. A *p* value < 0.05 was considered significant.

RESULTS

The SF-36 questionnaire was administered to 13 patients during the preoperative period and, on average, 8.1 months after surgery. A minimum three-month interval after the surgical procedure was always observed. Seven individuals were female and six were male. Mean patient age was 45.7 ± 18.3 , and normal individual mean age was 45.7 ± 17.0 . None of the patients smoked in the twelve months prior to surgery. All presented pulmonary hypertension, 9 (69%) met the criteria for the New York Heart Association functional class III, and all developed decreased oxygen saturation (Table 1). The following variables improved after surgery: functional capacity, physical aspects, pain, general health status, vitality, social aspects and emotional aspects. However, there was no change in the mental health variable (*p* = 0.087) (Table 2). Comparing the postoperative results regarding quality of life to those obtained from the group of normal individuals, whose values are also shown in Table 2,

we observed that the results were similar ($p > 0.05$) for all of the variables evaluated, except for the functional capacity variable. Comparing the preoperative results to those obtained from the group of normal individuals, statistical differences were found for all variables except mental health ($p < 0.05$).

DISCUSSION

There are currently two principal forms of surgical treatment for CTEPH: pulmonary thromboendarterectomy, which is the treatment of choice for patients in whom the vascular obstruction is proximal to the pulmonary artery; and lung transplant, which is indicated when the thrombi are predominantly located in the distal portion of the pulmonary vessels.

Long-term clinical treatment of CTEPH patients has always presented less than impressive results. However, a recent study showed that the use of sildenafil is a promising alternative, although the study involved a sample of only twelve patients⁽⁸⁾.

Thromboendarterectomy is indicated for CTEPH patients presenting significant functional limitation and pulmonary hypertension due to surgically accessible proximal thrombi⁽²⁾.

Several health-related quality-of-life questionnaires have been validated for application in Brazil. Some, such as the SF-36, are generalized, whereas others – such as those used for evaluating asthmatics⁽⁹⁾ or patients with chronic obstructive pulmonary disease^(10,11), or even for evaluating the results of surgical procedures such as sympathectomies⁽¹²⁾ – are more specific.

These questionnaires may be used in various ways, such as for characterizing a population by differentiating between normal and sick individuals (known as cross-sectional validation), or as instruments of longitudinal application for evaluating the efficacy of a program or therapeutic approach⁽⁹⁾. In order to evaluate the impact of pulmonary thromboendarterectomy on the quality of life of CTEPH patients, we used the SF-36 questionnaire, which is a nonspecific instrument that permits a longitudinal application.

Although circulatory improvement after pulmonary thromboendarterectomy has been documented^(4,5), there have been no controlled studies of the long- and short-term hemodynamic results in patients submitted to thromboendarterectomy. However, the clinical response in most of these patients is favorable, and it has been demonstrated that pulmonary

TABLE 1

Patient characteristics, pulmonary artery systolic pressure, functional class and oxygen saturation

Patient	Age (years)	Gender (mmHg)	PASP class (NYHA)	Functional saturation	O ₂ (%)
1	43	F	127	III	91
2	42	F	68	III	92
3	80	M	75	III	92
4	67	M	87	III	92
5	36	M	108	III	91
6	76	F	70	IV	80
7	35	M	70	III	91
8	22	M	118	III	90
9	53	F	45	II	92
10	25	M	106	III	93
11	35	F	68	III	92
12	44	F	77	II	92
13	36	F	80	II	92

PASP: pulmonary artery systolic pressure; NYHA: New York Heart Association

TABLE 2

Mean \pm standard deviation of each SF-36 item prior to and after surgery in both study and control group individuals

SF-36	Preoperative	Postoperative (pre vs. post)	<i>p</i>	Controls
Functional capacity	28.9 \pm 25.3**	78.5 \pm 22.2***	0.0001	92.3 \pm 7.5
Physical aspects	11.5 \pm 28.2**	68.1 \pm 39.0	0.0005	92.3 \pm 27.7
Pain	54.8 \pm 22.4*	70.0 \pm 24.7	0.0372	77.2 \pm 21.1
General health status	49.1 \pm 18.3**	83.4 \pm 17.3	0.0001	86.3 \pm 9.1
Vitality	42.3 \pm 18.3**	78.5 \pm 26.8	0.0033	67.7 \pm 16.8
Social aspects	43.3 \pm 30.0**	82.3 \pm 19.0	0.0010	84.6 \pm 19.6
Emotional aspects	35.9 \pm 48.0*	84.5 \pm 32.3	0.0215	76.9 \pm 39.4
Mental health	61.2 \pm 24.2	77.0 \pm 22.3	0.0872	78.5 \pm 19.5

SF-36: Medical Outcome Study 36-item Short-Form Health Survey

* $p < 0.05$ (preoperative vs. controls); ** $p < 0.001$ (preoperative vs. controls); *** $p < 0.05$ (postoperative vs. controls)

pressure and resistance decrease quite significantly or even normalize⁽¹⁾. Therefore, we can suppose that the improvement in the quality of life of these individuals may be due to the clinical improvement promoted by the surgery, which must aim to decrease pulmonary artery pressure and consequently improve dyspnea, physical capacity, social performance and professional performance, as well as social and emotional aspects, that had been severely affected by the disease.

Although the SF-36 questionnaire is meant to be completed by patients themselves, in this protocol we opted for having the questionnaire first administered by one of our researchers and letting patients complete the questionnaire themselves only after surgery. This decision was based on the fact that many patients are of low sociocultural status and, as a result, have a certain amount of difficulty in understanding some questions. These difficulties were overcome after the initial administration of the questionnaire, in which all of the questions were answered properly.

Zoia et al.⁽⁵⁾, in a study involving 33 patients, observed significant improvement in cardiac function and arterial oxygen tension 3 months following thromboendarterectomy, with no further increases. However, pulmonary artery pressure, carbon monoxide diffusion capacity and exercise tolerance improved progressively until the second year after the surgical procedure, probably due to the slow recuperation of the smaller-caliber blood vessels. In view of this, we designed the present study so that a minimum three-month period following surgery was observed before the SF-36 questionnaire was sent to the patients.

Comparing the results obtained after thromboendarterectomy with those of the thirteen normal individuals, we observed that the following variables were similar: physical aspects, pain, general health status, vitality, social aspects, emotional aspects and mental health. However, functional capacity was lower in the study group. These results suggest that, after surgical intervention, these individuals have a near-normal quality of life. Archibald et al. also used, retrospectively, the SF-36 questionnaire to evaluate the impact of pulmonary thromboendarterectomy on the quality of life of CTEPH patients⁽⁴⁾. The authors compared preoperative data obtained from 39 patients with postoperative data from 306 different individuals and found significant postoperative improvement in all indicators except mental health. In our prospective

protocol, in which all patients were evaluated prior to and after surgery, the result was similar. There was improvement in all SF-36 domains, with the exception of the mental health domain, which remained unaltered (Table 2).

In conclusion, despite the small number of patients studied, we demonstrated that pulmonary thromboendarterectomy had a highly positive effect on the quality of life of patients with pulmonary hypertension secondary to chronic thromboembolism.

REFERENCES

1. Fedullo PF, Auger WR, Kerr KM, Rubin LJ. Chronic thromboembolic pulmonary hypertension. *N Engl J Med.* 2001;345:1465-72.
2. Terra-Filho M. Uso racional dos métodos diagnósticos na doença tromboembólica pulmonar. In: Faresin SM, Stelmach R, Oliveira MVC, Stirbulov R, editores. *Pneumologia atualização e reciclagem.* Rio de Janeiro: Revinter; 2003. p. 239-44.
3. Jatene FB, Bernardo WM, Monteiro R, Hueb AC, Terra-Filho M, Oliveira SA. Tratamento cirúrgico da hipertensão pulmonar tromboembólica. *Rev Soc Cardiol Est São Paulo.* 2000;5:640-51.
4. Archibald CJ, Auger WR, Fedullo PF, Channick RN, Kerr KM, Jamieson SW, et al. Long-term outcome after pulmonary thromboendarterectomy. *Am J Respir Crit Care Med.* 1999;160:523-8.
5. Zoia MC, D'Armini AM, Beccaria M, Corsico A, Fulgoni P, Klersy C, et al. Mid term effects of pulmonary thromboendarterectomy on clinical and cardiopulmonary function status. *Thorax.* 2002;57:608-12.
6. Ware JE, Sherbourne CA. The MOS 36-item short-form health Survey (SF-36) conceptual framework and item selection. *Med Care.* 1992;30:473-83.
7. Ciconelli RM. Tradução e validação para o português do medical outcomes Study 36-Item Short-Form Health Survey (SF-36) [tese]. São Paulo: Universidade Federal de São Paulo, Escola Paulista de Medicina; 1997.
8. Ghofrani HA, Schermuly RT, Rose F, Wiedermann R, Kohstall MG, Kerckel A, et al. Sildenafil for long-term treatment of nonoperable chronic thromboembolic pulmonary hypertension. *Am J Respir Crit Care Med.* 2003;167:1139-41.
9. Fernandes ALG, Oliveira MA. Avaliação da qualidade de vida na asma. *J Pneumol.* 1997;23:148-52.
10. Sousa TC, Jardim JR, Jones P. Validação do questionário do Hospital Saint George na doença respiratória (SGRQ) em pacientes portadores de doença pulmonar obstrutiva no Brasil. *J Pneumol.* 2000;26:119-25.
11. Camelier A, Rosa F, Jones P, Jardim JR. Validação do questionário de vias aéreas 20 ("Airways questionnaire 20"-AQ20) em pacientes portadores de doença pulmonar obstrutiva crônica (DPOC) no Brasil. *J Pneumol.* 2003;29:28-35.
12. Campos JRM, Kauffman P, Werebe EC, Andrade Filho LO, Kusniek S, Wolosker N, et al. Questionário de qualidade de vida em pacientes com hiperhidrose primária. *J Pneumol.* 2003;29:178-81.