

## GENERAL PHYSICIANS AND THE MANAGEMENT OF HEART FAILURE IN AN ARGENTINE POPULATION

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**Abstract** The aim of this study was to assess how general physicians (GP) think that heart failure (HF) should be managed and how they implement their knowledge. It was conducted in Buenos Aires City and suburban area, with the collaboration of 5 cardiologists, and 29 GP who were selected randomly, and were asked to keep a log of all patients they saw with HF. The methodology was similar to that employed in an international initiative named "Improvement" already performed in Europe. Data were obtained of 220 note patients. GP knowledge and perceptions about the management of HF were assessed initially with a "perception survey", and later on how a representative sample of patients was managed, with an "actual practice survey". The electrocardiogram and the chest radiograph were recorded in most patients ( $\approx 90\%$ ), but the echocardiogram only in 67% of cases. Forty percent of the patients had history of myocardial infarction and ischaemic heart disease, but exercise test was not considered as a potential diagnostic test and was recorded only in 16% of the patient records. Likewise coronary angiogram was performed in 7% of patients. Only 23% of the patients had a left ventricular ejection fraction test result documented in their charts. In practice, 43% of GP patients were receiving an ACE inhibitor and one third betablockers. Only 9% received these drugs in combination. At the last interview, 50% had hypertension (blood pressure  $\geq 140/90$ ) and 15% had not recorded this data in patients notes. This study identified, in a random sample of GP of Buenos Aires City and suburbs, that management of HF was less than optimal.

**Key words:** heart failure, general physicians, secondary prevention

**Resumen** *Los médicos generales y el tratamiento de la insuficiencia cardíaca en una muestra de la población argentina.* El objetivo de este estudio fue evaluar cómo los médicos generales (MG) piensan que debe tratarse la insuficiencia cardíaca (IC) y cómo ponen en práctica su conocimiento. Se realizó en la ciudad de Buenos Aires y su área suburbana, con la colaboración de 5 cardiólogos, y de 29 MG que fueron seleccionados al azar, a los cuales se les solicitó que guardasen las historias clínicas de todos los pacientes que ellos habían atendido con IC. Se obtuvieron los datos de 220 pacientes. La metodología fue similar a la utilizada en una iniciativa internacional llamada *Improvement* realizada en Europa. Se evaluó el conocimiento de los MG y su percepción sobre el manejo de la IC mediante una "encuesta de percepción", y cómo una muestra representativa de pacientes fue tratada, a través de una "encuesta sobre la práctica". El electrocardiograma y la radiografía de tórax se le pidieron a la mayoría de los pacientes ( $\approx 90\%$ ), pero el ecocardiograma se pidió sólo en el 67% de casos. Cuarenta por ciento de los pacientes tenían historia de infarto de miocardio y de angina de pecho, pero la ergometría no fue considerada como una prueba de diagnóstico importante y sólo se asentó en el 16% de las HC. Igualmente la cinecoronariografía se realizó en el 7% de pacientes. Sólo el 23% de los pacientes tenían una fracción de eyección del ventrículo izquierdo documentada en sus HC. En la práctica, el 43% de pacientes estaban recibiendo un inhibidor de la ECA y una tercera parte betabloqueantes. Sólo 9% recibieron estas drogas combinadas. En la última entrevista, 50% tenían hipertensión arterial ( $\geq 140/90$  mmHg) y en 15% no se había consignado este dato en las HC de los pacientes. Este estudio mostró que el conocimiento y tratamiento de la IC en una muestra de MG, era menor que el óptimo.

**Palabras clave:** insuficiencia cardíaca, médicos generales, prevención secundaria

Chronic heart failure (HF) is a common clinical condition with high morbidity and mortality<sup>1</sup>. It has a major im-

pact on longevity and quality of life and all its forms affects 1-2% of the populations of developed countries, representing an escalating healthcare problem<sup>1-5</sup>. Its prevalence rises with age, and it probably affects 10% of people aged over 65 years<sup>6</sup>.

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As a consequence of a better understanding of the pathophysiology and the results of large clinical trials, the

HF is a condition that can be treated effectively. It is possible to reduce duration and frequency of hospitalizations, relieve some of the disabling symptoms and reduce the risk of death. Nowadays, improving outcomes increasingly depend on appropriate communication between healthcare professionals, education of patients and better chronic disease management.

With the objective of improving the care of patients with HF, the Task Force on HF of the European Society of Cardiology<sup>7</sup> and the American College of Cardiology and the American Heart Association<sup>8</sup> have published guidelines on the diagnosis and treatment of this disease. However, in spite of the publication of these evidence-based guidelines, numerous studies have documented the underutilization of the key processes of care<sup>9-11</sup>.

The quality of patient care for HF is directly associated with readmission rates and mortality<sup>12, 13</sup>. Many HF admissions may be prevented with good outpatient care<sup>14</sup>. The HF management should include the provision of adequate resources for diagnosis and the development of new strategies for optimum care in different settings.

There is insufficient evidence about the role of the general physician (GP) and cardiologists in the care of patients with HF. Some studies indicate that primary care physicians have less knowledge about HF and adhere to guidelines less closely than cardiologists<sup>15, 16</sup>. Other studies showed a better patient outcomes in patients cared for by cardiologists than in those cared for by GP<sup>17, 18</sup>.

In Europe, Cleland JL et al. conducted a study with the participation of 15 countries known as "Improvement"<sup>19</sup>. It included 1 363 primary care physicians who provided data from 11 062 patients. Eighty two percent of patients had had an echocardiogram. Most physicians were aware of the benefits of ACE inhibitors and betablockers. Sixty percent of patients were prescribed ACE inhibitors, 34% betablockers and 20% received these drugs in combination. Results from this survey suggested that most patients with HF were appropriately investigated, however, treatment seems to be less than optimum, and there were substantial variations in practice between countries.

In Argentina, patients with HF are managed mostly by cardiologists, but another portion of patients are managed by GP. Such physicians have a key role in early identification, adequate assessment, and optimum treatment of HF. However, none studies provide information in our country about GP knowledge on the management of HF, and how this knowledge translates into clinical practice.

The aim of this study was to investigate how GP perceive that HF should be diagnosed and treated, and how they implement to knowledge.

## Materials and Methods

The study was conducted by means of two sets of questions that were based on the original "Improvement" structure and the

international guidelines for the diagnosis and treatment of HF published in 1995, 1997 and 2000<sup>6, 7, 20</sup>. The original study protocol was changed and adapted to our country. The perception questionnaire used 96 questions to analyze GP knowledge about the management of HF and their perception of how they apply their knowledge in their current practice. The "actual practice" questionnaire had 131 questions to find out what actually happened currently in clinical practice. Information to be provided by participating GP from patients case notes included: history, etiology and symptoms of the HF, proportions of patients receiving echocardiography, GP' treatments objectives and advises given to patients on lifestyle, drug and vaccination.

The survey was done in Buenos Aires City and suburbs. It was considered GP to those who were not cardiologists and do not assist patients of a single specialty. First, three representative areas of the city (Belgrano, Flores and Abasto) and two from the suburbs (Matanza and Olivos) were randomly selected. Then, from a list of GP whose offices were in each area (Belgrano: 105 GP, Flores: 128 GP, Abasto: 57 GP, Matanza 150: GP and Olivos: 51 GP), a random sample of ten per area were selected. Five consultant cardiologists who were recruited to coordinate the study, contacted them. Twenty one GP did not agree to participate in the study.

Physicians who agreed to participate were interviewed 1 month before the study began, and were asked to keep a log of all their HF patients they saw. Afterward, the GP with the help of trained interviewers completed the perception and practice surveys. The "practice survey" was conducted by means of the notes of patients with HF that had been entered in the log.

### Statistical analysis

In our study, with a probability of 50% as the worst case, the 95% confidence interval around an observation in a data set containing 220 patients would be 43.4% to 56.6%. Most statistical analyses were descriptive and were done in subsets of patients defined by specific characteristics. All analyses were performed with EPI info 6.

## Results

### Perception survey

Twenty nine GP agreed to participate in the study. Table 1 shows that a half of participating GP were older than 50 years, and one third were female. More than two third of physicians were aware of the New York Heart Association classification system of HF symptoms, but less than a half used it in the routine practice. Nearly 90% of GP would ask for an echocardiogram to differentiate systolic from diastolic dysfunction.

All (100%) GP responded that they would usually request an electrocardiogram and a chest radiography in patients with suspected HF; 90% would ask for an echocardiogram (Table 2). Only 17% and 14% would request for an exercise test or a holter monitoring respectively.

Table 2 shows that in a patient with HF, all physicians would indicate salt intake restriction, counseling about smoking cessation and near 90% would restrict alcohol intake. Seventy percent would prescribe increasing amount of exercise and a half would indicate more fre-

TABLE 1.— *General physicians characteristics and their knowledge about the management of heart failure (perception survey).*

		General physicians (29) n and %
Age (years)	30-40	5 (17.2%)
	40-50	9 (31.0%)
	> 50	15 (51.7%)
Male		19 (65.5%)
Awareness of the New York Heart Association clasification system of heart failure symptoms		21 (72.4%)
Use of the New York Heart Association clasification system of heart failure symptoms in the routine practice.		13 (44.8%)
How the general physicians differentiate systolic from diastolic dysfunction?		
	Symptoms	14 (48.3%)
	Cardiomegaly	4 (13.8%)
	Chest-X-ray	11 (37.9%)
	Echocardiography	26 (89.7%)

quently influenza vaccination. GP would frequently prescribe an ACE inhibitor in symptomatic HF due to left ventricular systolic dysfunction, in patients with a history of myocardial infarction, and in those who have important LV systolic dysfunction even asymptomatic. They would not usually prescribe ACE inhibitors in patients with serum creatinine > 50% above the normal range, and in those with systolic blood pressure < 100 mm Hg. GP would frequently prescribe a betablocker in HF, only in patients with a history of myocardial infarction.

Ninety percent of GP think that ACE inhibitors improve symptoms and prognosis in HF, and seem less convinced about the efficacy of betablockers (Table 3).

#### *Actual Practice Survey*

Data were obtained from 220 patient notes (Table 4). Mean age of patients was 75.8 years (SD= 10.5), and 46% were males. One third were current smokers. The proportion of patients' records on whom information was not available were the following: weight: 20%, alcohol consumption: 52%, and physical activity 44%. The body mass index was calculated and recorded only in 10% of patient's notes. Eighty six percent and 67% of patients had breathlessness on exertion and edemas respectively. The New York Heart Association classification to quantify the HF severity was employed in 36% of patients. Most GP used other scale. According this scale 23% had a light, 24% a moderate and 17% a severe HF. Only in 1% (3 patients) of patients there was no reported any classification to quantify the HF. Forty percent patients was considered to have coronary heart disease (myocardial inf-

arction or ischaemic heart disease) and in 69% the hypertension was the etiology of their HF.

At the last interview, a half of patients had uncontrolled blood pressure and 15% had not recorded this data in patients notes (Table 5). In 60% of the patient's notes, there was no information about the patients weight.

Ninety two percent, 88% and 67% of patients had performed an electrocardiogram, a chest radiograph and a echocardiogram respectively (Table 6). Only 16% had an exercise test. Ejection fraction was reported only in 23% of patients, and the technique used to obtain it, was preferably the echocardiography.

About the non pharmacological measures, salt intake restriction was the most common (82%) followed by vaccination against influenza (75%) and drug compliance advisement (73%). Diet against overweight (49%) and dyslipemia (45%) were less common. Measures less frequently used were advisement on smoking cessation (22%) and against alcohol intake (19%).

In practice, 43% of patients were receiving an ACE inhibitor and about one third a betablocker (Table 7). Only 8.6% (19 patients) received these drugs in combination. Diuretics were prescribed in a half of the patients, 28% were receiving digitalis and 27% calcium channel blockers. Twenty eight percent were receiving aspirin and only 12.3% anticoagulants.

## **Discussion**

Our study, the first survey on HF in general practice in Argentina, shows in a random sample of GP from Buenos Aires City and suburbs, their perception in the man-

TABLE 2.— Tests and treatments asked by general physicians (29) to patients with heart failure (perception survey).

	Frequently	Sometimes	Unfrequently
In a patient with heart failure the general physicians would ask for the following tests			
Full blood count (n and %)	24 (85.7)	3 (10.7)	1 (3.6)
Exercise test (n and %)	3 (16.7)	10 (55.6)	5 (27.8)
ECG (n and %)	29 (100.0)	—	—
Chest X ray (n and %)	29 (100.0)	—	—
Peak flow spirometry (n and %)	1 (7.7)	4 (30.8)	8 (61.5)
Echocardiography (n and %)	24 (88.9)	2 (7.4)	1 (3.7)
Echo-doppler (n and %)	8 (36.4)	11 (50.0)	3 (13.6)
Holter monitoring of 24 hs (n and %)	3 (14.3)	14 (66.7)	4 (19.0)
In a patient with heart failure, the general physicians would prescribe.			
Salt intake restriction (n and %)	29 (100.0)	—	—
Vaccination for influenza (n and %)	12 (48.0)	10 (40.0)	3 (12.0)
Increasing amount of exercise (n and %)	17 (68.0)	5 (20.0)	3 (12.0)
Increasing amount of rest (n and %)	7 (29.2)	13 (54.2)	4 (16.7)
Counseling about smoking cessation (n and %)	29 (100.0)	—	—
Alcohol consumption (n and %)	22 (88.0)	2 (8.0)	1 (4.0)
Vitamin supplements (n and %)	1 (5.6)	4 (22.2)	13 (72.2)
The general physicians would prescribe an ACE inhibitor in the following situation.			
Symptomatic heart failure due to LV systolic dysfunction (n and %)	23 (79.3)	6 (20.7)	—
Heart failure due to left ventricular diastolic dysfunction (n and %)	12 (42.9)	11 (39.3)	5 (17.9)
Patients with a History of MI (n and %)	17 (58.6)	10 (34.5)	2 (6.9)
Important LV systolic dysfunction even asymptomatic (n and %)	14 (60.9)	7 (30.4)	2 (8.7)
Patients with serum creatinine > 50% above the normal range (n and %)	5 (18.5)	8 (29.6)	14 (51.9)
Patients with systolic blood pressure < 100 mmHg. (n and %)	5 (17.9)	11 (39.3)	12 (42.9)
The general physicians would prescribe a beta blocker in the following situation.			
Symptomatic heart failure due to LV systolic dysfunction (n and %)	3 (11.1)	11 (40.7)	13 (48.1)
Patients with rapidly worsening heart failure (n and %)	3 (11.5)	2 (7.7)	21 (80.8)
Heart failure due to LV diastolic dysfunction (n and %)	8 (28.6)	9 (32.1)	11 (39.3)
Patients with a History of MI (n and %)	20 (69.0)	8 (27.6)	1 (3.4)
Important LV systolic dysfunction even asymptomatic (n and %)	3 (11.1)	10 (37.0)	14 (51.9)

LV: left ventricle

MI: myocardial infarction

agement of patients with HF and how they implement their knowledge. It shows that patients managed by GP presented a high rate of hypertension, ischaemic heart disease and diabetes. The prevalence of idiopathic dilated cardiomyopathy was 8%. Less than 11% had had history of myocardial infarction, in contrast with rates observed in randomized trials<sup>21, 22</sup>. Probably, the low prevalence of echocardiograms requested by the GP play a role in these results. The echocardiogram is the single most useful diagnostic test in the evaluation of patients with HF. It determine whether the primary abnormality is pericardial, myocardial, or valvular and if myocardial, whether the

dysfunction is primarily systolic or diastolic. Furthermore it allows the measurement of left ventricular ejection fraction. Therefore, the better way of diagnosing necrotic areas is through the echocardiogram and in this sample was underemployed.

In our investigation, chest radiograph, electrocardiogram and echocardiogram were considered by the GP as important diagnostic tools. The electrocardiogram and the chest radiograph were recorded in most patients ( $\approx 90\%$ ), but the echocardiogram only in 67% of cases. It is known that measurement of left ventricular performance is a critical step in the evaluation and management

TABLE 3.— Responses of general physicians (29) to the statement "In patients with heart failure and left ventricular systolic dysfunction, the following treatments have definitely been shown to improve symptoms and/or prognosis" (perception survey).

	Symptoms n (%)	Prognosis n (%)
Diuretics	26 (89.7)	13 (44.8)
ACE inhibitors	26 (89.7)	26 (89.7)
Nitrates	21 (72.4)	8 (27.6)
Calcium blockers	15 (51.7)	10 (34.5)
Beta blockers	15 (51.7)	13 (44.8)
Digitalis	27 (93.1)	12 (41.4)
Aspirin	11 (37.9)	19 (65.5)
Statins	10 (34.5)	20 (69.0)

of almost all HF patients. The use of the clinical history, physical examination, chest radiography and electrocardiogram are not sufficient to determine the origin of HF. Therefore echocardiogram or radionuclide ventriculography can substantially improve diagnostic accuracy. In our sample, echocardiogram was indicated in two thirds of cases and radionuclide ventriculogram in 12%. Therefore in 20% of cases the GP did not evaluate the left ventricular performance. Furthermore the ejection fraction was assessed in 23% of the patients records. These results shows an inconsistency between perception and practice, thus GP stated that they would usually request an echocardiogram (89%) and in the current practice there are only 67% of patients with echocardiogram.

The most common cause of HF in the developed world is coronary heart disease<sup>23,24</sup>. Such patients usually have obvious abnormalities of the systolic function of the left ventricle. Identification of ischaemic zone is particularly important. In our study, history of myocardial infarction and ischaemic heart disease constituted 40% of the patient. Exercise test was not considered as a potential diagnostic test and was recorded only in 16% of patient records. Likewise coronary angiogram, that is required to exclude a diagnosis of CAD in patients presenting HF of unknown etiology and can document the extent of coronary artery disease, was performed only in 7% of patients.

Dyspnea is the principal symptom in both pulmonary disease and HF, so it is important to distinguish between both diseases. The peak flow spirometry is a cheap test that could be important in the differential diagnosis. Furthermore, this test could be useful in patient treatments decision, because there are drugs that are used to treat HF that can produce or exacerbate pulmonary symptoms. Nevertheless the peak flow spirometry was not considered as an important test by the GP (12% of patients).

TABLE 4.— Information available from age, sex, coronary risk factors and clinical characteristics in the patients notes (practice survey).

	220 patients with heart failure n (%)
Age (years, mean $\pm$ SD)	75.8 $\pm$ 10.5
Weight (kg mean $\pm$ SD) (176 patients)	72.9 $\pm$ 15.9
Not recorded	44 (20)
Males	101 (45.9)
Smoking (current)	67 (30.5)
Body mass index	
Calculated and recorded	22 (10)
Not recorded	198 (90)
Alcohol consumption	
Recorded as positive	99 (45.0)
Recorded as negative	7 (3.2)
Not recorded	114 (51.8)
Exercise or physical activity	75 (34.1)
Recorded as positive	112 (50.9)
Recorded as negative	11 (5.0)
Not recorded	97 (44.0)
Patients' symptoms	
Breathlessness on exertion	190 (86.4)
Orthopnea	85 (38.6)
Edemas	148 (67.3)
Cough	93 (42.3)
Third heart sound	64 (29.1)
Pulmonary crepitations	86 (39.1)
Raised venous pressure	89 (40.5)
Heart failure severity recorded according to the New York Heart Association classification	
I	16 (7.3)
II	21 (9.5)
III	30 (13.6)
IV	12 (5.5)
Not recorded	141 (64.1)
Other classification of heart failure	
Light	50 (22.6)
Moderate	52 (23.6)
Severe	38 (17.3)
Not recorded	80 (36.4)
Patient with coronary heart disease	
Yes	88 (40.0)
No	117 (53.2)
Unknown	15 (6.8)
Factors contributing to heart failure	
History of myocardial infarction	25 (11.4)
Ischaemic heart disease but no evidence of myocardial infarction	68 (30.9)
Hypertension	152 (69.1)
Diabetes	53 (24.1)
Valve disease	35 (15.9)
Atrial fibrillation	38 (17.3)
Obesity	56 (25.5)
Alcohol	5 (2.3)
Congenital heart disease	1 (0.5)
Idiopathic dilated cardiomyopathy	17 (7.7)
Age	98 (44.5)
Chagas	1 (0.5)

TABLE 5.— *Information available in the patients notes about the last interview (practice survey).*

	220 patients with heart failure n (%)
Blood pressure in the last interview.	
Controlled (<140/90)	78 (35.5)
Not controlled (>139/89)	109 (49.6)
Not recorded in the patients' notes	33 (15.0)
Body mass index in the last interview estimated according the weight and the height of the patients.	
< 25	38 (17.3)
25-30	27 (12.3)
>30	16 (7.3)
Without information about the patients weight	130 (59.1)

TABLE 6.— *Tests performed on patients with heart failure by the general physician (practice survey).*

	220 patients with heart failure n (%)
Tests	
ECG	188 (91.8)
Chest X-ray	193 (87.7)
Echocardiogram	147 (66.8)
Echo-stress (%)	4 (1.9)
Radionuclide ventriculogram	27 (12.3)
Cardiac catheterism	13 (5.9)
Coronary Arteriography	15 (6.8)
Exercise test	35 (15.9)
Test of lung function (spirometry)	27 (12.3)
Blood sample	
Haematocrit	209 (95.0)
Electrolytes	187 (85.0)
Urea or creatinine	204 (92.7)
Lipids	201 (91.4)
Ejection fraction of the left ventricle	
Recorded	50 (22.7)
Not recorded	170 (77.3)
Technique used to obtain the ejection fraction of left ventricle	
Echocardiography	42/50 (84)
Radionuclide ventriculogram	8/50 (16)

The use of ACE inhibitors in patients with HF with left ventricular systolic dysfunction is supported by solid evidence on efficacy and cost effectiveness<sup>21, 25</sup>. A meta-

TABLE 7.— *Use of drug therapies and advices given to the patients with heart failure (practice survey).*

	220 patients with heart failure n (%)
Drugs	
ACE-inhibitors	95 (43.2)
Beta blockers	67 (30.5)
Digitalis	61 (27.7)
Diuretics	117 (53.2)
Aspirin	63 (28.6)
Nitrates	63 (28.6)
Anticoagulant	27 (12.3)
Calcium blockers	59 (26.8)
ACEIs+ $\beta$ blockers	19(8.6)
Advices given or treatments administered	
Counseling about smoking cessation	48 (21.8)
Alcohol consumption	43 (19.5)
Salt intake	194 (88.2)
General diet against overweight or obesity	108 (49.1)
Vitamin supplements	49 (22.3)
Drug compliance	160 (72.7)
Vaccination for influenza	166 (75.5)
Diet against hiperlipemia	99 (45)
Increasing amount of rest	92 (41.8)
Increasing amount of exercise	90 (40.9)

analysis estimated that treatment with ACE inhibitors was associated with a 17% reduction in the risk of death<sup>26</sup>. In our study GP knowledge about the ACE inhibitors actions and indications was not sufficient. They would frequently prescribe an ACE inhibitor in symptomatic and asymptomatic HF due to left ventricular systolic dysfunction and in patients with a history of myocardial infarction, but they considered that this drugs have substantial risks to be used in patients with not markedly increased levels of serum creatinine (Table 2) and in those with low systolic blood pressure. In practice only 43% of general physician patients were receiving an ACE inhibitor.

Long-term treatment with betablockers can reduce HF symptoms, improve the clinical status of patients<sup>27-30</sup> and reduce the risk of death and the combined risk of death or hospitalization<sup>31-33</sup>. Betablockers should be prescribed to all patients with stable HF due to left ventricular systolic dysfunction unless they have a contraindication to their use. In our investigation, GP were not well informed about the use of betablockers. Only 11% would use it frequently in patients with asymptomatic or symptomatic HF due to LV systolic dysfunction. In practice, only about a third of GP patients with HF were receiving a betablocker.

In general, ACE inhibitors are used together with betablockers. In patients who are taking an ACE inhibi-

tor, the addition of a betablocker produces a greater improvement in symptoms and reduction in the risk of death than an increase in the dose of the ACE inhibitor<sup>34</sup>. In our study only 9% of the patients were using these drugs combined.

Nowadays, a reduction in physical activity leads to a state of physical deconditioning that contributes to the symptoms and exercise intolerance of patients with chronic HF<sup>35, 36</sup>. Some studies have shown that exercise training can lessen symptoms, increase exercise capacity and improve the quality of life of patients with chronic HF<sup>37-39</sup>. Patients with HF should be advised to stay as active as possible. In our study 68% of GP would prescribe frequently an increasing amount of exercise. But in practice, only 42% of patients with HF received general advice about increasing the amount of exercise.

Hypertension is an important risk factor for the development of HF due to systolic or diastolic ventricular dysfunction. But in our study, GP patients were not correctly controlled. In the last interview many patients (50%) had systolic blood pressure greater than 140/90 mm Hg. Probably, the low use of ACE inhibitors (43%), betablockers (31%) and calcium blockers (27%) in a population with a wide proportion of hypertensives (69%), would have same influence in these results. Furthermore, in nearly 60% of patients there was no information about the patients weight and in those in whom this data was assessed (43/81), a half were overweight or obese. These results could be associated with the scarce advice given by GP to their patients about a general diet against overweight or obesity (49%).

Eighty eight percent of GP would prescribe alcohol consumption restriction, but in general practice only 19% of patients received this advisement. All GP would prescribe counseling about smoking cessation, but 31% of patients smokes and only 21% of then received this advisement.

Why GP do not adopt established clinical guidelines when safe, and effective treatments are strongly stated and available?

Among the possible causes that might explain the underuse of these standards, the following may be mentioned: 1) the interventional epidemiological studies, which provide the evidence on which the consensus's base their standards, include highly selected patients who are motivated to adhere to prescribed treatments. Patients who go to the office in the setting of the usual medical practice are generally older (in our study, the mean age of the patients was 75.8 years), have concomitant diseases and are not selected for their predisposition to comply with a treatment, 2) GP who are in contact with patients, might have different criteria to evaluate the evidence of epidemiological studies and currently do not agree with the recommendations of the consensus.

### *Strengths and limitations of the study*

A major strength of this study is that it has allowed us to obtain information about the perception and management of HF from a sample of GP of Buenos Aires city and suburbs and provide a basis for planning other investigations in Argentina. These studies would be the background to develop health care policies focused on our country's reality. Among the limitations, we may consider the incomplete participation of the GP (almost a forty percent did not agree to participate in the study). Nevertheless, those who did participate probably were most interested in the management of HF and might be well predisposed to participate in the investigation due to their special interest in the matter, and therefore results from this study might not accord with current practice, and probably reports better results.

In conclusion, with the exception of exercise and pulmonary functional tests, GP seemed to be informed about appropriate investigations and general counseling that should be prescribed on patients with HF. On the other hand, regarding HF treatment, GP had a partial knowledge about the benefits of ACE inhibitors and unknown the favorable effects of betablockers. In practice, the tests and the advisement's given to the patients were insufficient, likewise the rate of ACE inhibitors and betablockers prescribed were low. We observed a gap between the evidence based knowledge and the poor implementation of it in the current clinical practice in a well defined subset of doctors and patients with a specific pathology.

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## Appendix

### Role of the funding source

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were done entirely independently of the company. Servier personnel were present as observers during the meetings.