

ORIGINALES

## Common health problems management uncertainties in heart failure: a qualitative study

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### Abstract

**Background:** Medicine review with follow up quantitative studies conducted on heart failure (HF) outpatients detected health problems that were frequently treated insufficiently: hyperuricemia, gastric injury prevention, anemia, and diabetes mellitus.

**Objective:** The aim of this qualitative study was to explore experiences in the pharmacological management of these health problems, and to contribute with strategies to overcome the identified obstacles.

**Methods:** The internal medicine specialists and cardiologists of a tertiary hospital HF clinic underwent in-depth semi-structured interviews and a constant comparative approach was used.

**Results:** Interviewees highlighted there is a lack of guidelines concerning the treatment of asymptomatic hyperuricemia in HF, thus in routine practice it is often not treated. Interviewees said that preventive strategies to avoid gastric injury in at-risk patients taking prophylactic low-dose aspirin are needed, but the most appropriate strategy is not well defined. Interviewees thought that structural support is needed for the management of HF patients with anemia, and proper clinic pathways should be created to identify which service patients should be referred to. The same lack of communication with other services appeared with diabetes mellitus.

**Conclusion:** HF specialists demand a closer interaction with other specialists for a comprehensive approach to these poly-medicated patients with multiple co-morbidities. And suggest that specific recommendations in HF guidelines to manage these co-morbidities specifically in HF would be helpful to shed light upon the existing confusing evidence.

### KEYWORDS

Heart failure; Pharmacological management; Hyperuricemia; Gastric injury; Anemia; Diabetes mellitus

### Incertidumbres en el manejo de problemas de salud frecuentes en insuficiencia cardiaca: un estudio cualitativo

#### Resumen

**Antecedentes:** Estudios de seguimiento farmacoterapéutico realizados en insuficiencia cardiaca (IC) detectaron problemas de salud insuficientemente tratados de manera frecuente: hiperuricemia, gastroprotección, anemia y diabetes mellitus.

**Objetivo:** El objetivo de este estudio cualitativo fue explorar las experiencias de los médicos en el manejo farmacológico de estos problemas de salud, y contribuir con estrategias para solventar los obstáculos identificados.

**Métodos:** Los especialistas en medicina interna y cardiología de la unidad de IC de un hospital terciario fueron entrevistados en profundidad con entrevistas semi-estructuradas utilizándose para su análisis el método de comparación constante.

**Resultados:** Los entrevistados destacaron que hay una falta de guías sobre el tratamiento de la hiperuricemia asintomática en IC, por lo que en la práctica clínica generalmente no se trata. Los otros servicios aparecieron al hablar de la diabetes.

**Conclusión:** Los especialistas en IC piden una interacción más cercana con otros especialistas para un abordaje más completo de estos pacientes polimedificados con múltiples comorbilidades. Y sugieren que sería de ayuda para aportar algo de luz en la confusa evidencia que existe el tener recomendaciones específicas en las guías de IC para manejar estas comorbilidades en pacientes con IC en concreto.

### PALABRAS CLAVE

Insuficiencia cardiaca; Manejo farmacológico; Hiperuricemia; Gastroprotección; Anemia; Diabetes mellitus

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## Introduction

Heart failure (HF) is a complex syndrome<sup>1</sup> with high morbidity and mortality<sup>2</sup>. Furthermore, there is strong evidence that drug-related morbidity and mortality is a major problem in healthcare as a whole<sup>3,4</sup>. Polymedication and older age have often been identified as important risk factors for drug-related morbidity<sup>5</sup>, and both of these characteristics are common in HF patients. In a quantitative study conducted to assess the clinical impact of a pharmacist integrated in a multidisciplinary HF clinic, we identified certain health problems that were commonly treated insufficiently despite the availability of appropriate pharmacological therapy by doing a medicine review with follow up program<sup>6</sup>. To achieve a better understanding of this issue and its potential solutions, a qualitative study was designed. *This understanding would help clinical pharmacists to provide more real and practical information and advice to the doctors.*

Traditionally, research in the health care field has been based largely on quantitative methods, by hypothesis measuring and testing. Due to the need to find answers to subjective questions generated in clinical practice, there has been a gradual introduction of qualitative techniques in the field of health sciences that produces descriptive data with a more holistic approach<sup>7</sup>. The combination of qualitative and quantitative methods, termed the mixed methods approach, is becoming widespread in health research, due to its ability to assess in greater depth unexpected findings generated by a preliminary quantitative investigation<sup>8</sup>, as in the previous study by Gastelurrutia et al.<sup>6</sup>. Qualitative methods can shed light on facilitators of and barriers to the uptake of promising interventions or evidence-based guidelines through characterization of key aspects of organizational context and clinical processes<sup>8</sup>. The aim of the current qualitative study was to explore experiences, feelings, and behaviors of clinicians in the pharmacological management of non-HF health problems in outpatients attending a HF clinic, and to contribute with strategies that can be tailored to overcome the identified obstacles.

## Methods

A qualitative investigation using in-depth, semi-structured interviews was conducted. All participants signed informed consent. This study used a total sample and a constant comparative approach. A number of steps were taken to ensure the rigor of the study, including attention to deviant cases and the inclusion of a wide range of verbatim data.

## Participants

The sampling frame was constructed from all medical specialists that had worked in the HF outpatient's clinic of a tertiary hospital in the previous three years. All five

elected medical doctors agreed to participate, identified from number 1 to number 5. Mean age was 38 years; there were four females and one male. The sample included two internal medicine specialists and three cardiologists, one being the chief cardiologist of the HF clinic. These participants ensured different points of view from several specialists being represented in the data set and allowed to reach saturation of the information. Only one of the interviewees (#5) is co-author of the manuscript.

## Interviews

Interviews were held in privacy in a hospital office. The main investigator conducted all the interviews, which were recorded and fully transcribed. Interviews ranged in time between 45-60 minutes and were structured around four insufficiently treated health problems previously detected<sup>6</sup>: hyperuricemia, risk of gastric injury due to the use of antiplatelet drugs, anemia, and diabetes mellitus (DM) (Figure 1).

## Data analysis

Transcriptions were independently analyzed by P.G. and M.A.G. Analyses were based on open coding using a constant comparative approach. Content analysis was assisted by N-Vivo® software.

## Results

Responses to the questions were analyzed in four categories corresponding to: hyperuricemia, risk of gastric

### General introduction

- HF is considered as a complex syndrome, what do you think about it?

### Specific topics

- Hyperuricemia in HF:
  - Is it a prognosis factor?
  - Is treatment required in asymptomatic hyperuricemia?
- Adverse effects of low dose antiplatelet agents:
  - Is prophylaxis required?
  - First-line drug for prophylaxis
- Anemia treatment in HF:
  - Hemoglobin target
  - Anemia follow-up
- DM treatment in HF:
  - Glycated hemoglobin levels
  - DM follow-up

**Figure 1.** Interviews structure.

injury due to the use of antiplatelet drugs, anemia, and DM (Table 1).

### Hyperuricemia

The interviewees were aware that hyperuricemia is a HF prognostic factor. However, during the interviews it became apparent that some clinicians were primarily concerned with hyperuricemia as related to acute gout attacks.

It was acknowledged that diuretics raise uric acid blood levels. Along this line, more severe patients (i.e. those with worse prognosis), are generally given larger diuretics doses, thus leading to higher uric acid levels. This led some interviewees to consider that the hyperuricemia-prognosis relationship may be just a statistical phenomenon.

*There is also an effect of furosemide on uric acid levels ... I don't know to what extent they are independent prognostic factors... (#3)*

In the interviewees' opinion, the main concern was that there is no study proving that treating hyperuricemia improves prognosis in HF, and there are no published guidelines concerning this issue.

*As far as I know, some studies have indeed been done, but there are not definitive guidelines about*

*how to treat it nor how to intervene if you detect asymptomatic hyperuricemia. (#2)*

Another factor greatly influencing the decision of physicians to begin a new drug is the perception that more medications mean worse quality of life. This may take precedence over survival in older patients.

*If I can remove a drug from a patient's regimen ... I don't care if it improves survival in a 85 year old patient, especially if he is particularly bothered by taking an extra pill. (#4)*

*I try to give the least number of drugs as possible ... it decreases quality of life having to pay attention to taking drugs continuously... and increases the feeling of being very sick if you are all day attending to the pillbox. (#2)*

However, some doctors also acknowledged the good efficacy and safety profile of available drugs to treat hyperuricemia, such as allopurinol, leading them to suggest that resolution of hyperuricemia should be considered a therapeutic goal in HF patients.

### Gastric prophylaxis

The interviewees acknowledged that many HF patients are at risk of having gastric injury due to the use of low

**Table 1.** Main obstacles and potential solutions identified

Health problem	Obstacles Potential solution
Hyperuricemia	<ul style="list-style-type: none"> <li>– Doubts about being a prognostic factor</li> <li>– No published guidelines</li> <li>– Add another drug means less quality of life</li> <li>• To state if it is considered as a therapeutic goal in HF<sup>a</sup> guidelines</li> </ul>
Gastric injury	<ul style="list-style-type: none"> <li>– Not clear which patients should be treated (criteria)</li> <li>– Risk of gastric injury due to antiplatelet treatment not seen as an important issue</li> <li>– High influence of hospital drug reference list</li> <li>• To clarify the candidates in cardiology guidelines</li> </ul>
Anemia	<ul style="list-style-type: none"> <li>– Lack of training in treating anemia</li> <li>– Multifactorial origin</li> <li>– Pharmacological treatment is complex</li> <li>– Guidelines do not include treatment and Hb<sup>b</sup> target in HF<sup>a</sup></li> <li>– Follow-up maybe for an indefinite period</li> <li>• Need of structural support, inclusion in HF<sup>a</sup> guidelines and clinical pathways to refer patients</li> </ul>
Diabetes mellitus	<ul style="list-style-type: none"> <li>– DM<sup>c</sup> management is not considered as a HF<sup>a</sup> unit task</li> <li>– Insufficient communication with other services when HbA1C<sup>d</sup> is not controlled</li> <li>• To develop clinical pathways to refer patients</li> </ul>

<sup>a</sup>HF, heart failure; <sup>b</sup>Hb, hemoglobin; <sup>c</sup>DM, diabetes mellitus; <sup>d</sup>HbA1C, glycated hemoglobin.

dose antiplatelet drugs (aspirin 100 mg) and, to avoid gastric complications, prophylaxis should be started in some patients. However, according to their responses, it is not clear which patients should be treated prophylactically, and the risk of gastric injury is not recognized as an important matter.

*Yes, I believe and it is proved that with low-dose aspirin (100 mg) you have to treat for gastric injury. There are established criteria ... that I knew when I finished the internship. (#1)*

Some pointed out age of 65 years and above as a possible criterion, whereas others could not specify the age limit. The two internal medicine specialists declared that age should not be a criterion by itself to prescribe prophylaxis.

*Just for age, I am quite sparing. (#2)*

*Just for age, no. (#4)*

Other suggested criteria were history of gastric disorders and complaint of gastrointestinal symptoms by the patient, regardless of an established diagnosis of digestive disease.

*If they have a stomach ache, if they complain of dyspepsia even if they don't have a clear cut diagnosis, I usually treat. (#1)*

Concomitant medication was pointed out as a third criterion for intervention: corticosteroids, oral anticoagulants, or nonsteroidal antiinflammatory drugs (NSAIDs).

In terms of which medication should be first-line for prophylaxis, interviewees agreed on omeprazole *in lieu* of other proton pump inhibitors (PPI) such as pantoprazole. The latter drug was mentioned to be preferred by gastroenterologists because of fewer interactions with anti-coagulant drugs. Overall, the chosen PPI was that included in the hospital reference list:

*At the clinic, pantoprazole, because it is the one we usually use. (#4)*

*What I use most now is omeprazole mostly based on what I've been taught concerning other factors, but it depends on the hospital you work at. In the hospital where I worked before we used a lot of pantoprazole ... Here, pantoprazole is hardly used, so I end up prescribing much more omeprazole. (#2)*

During the interviews it was noticed that if a patient takes any gastric protective agent, either an antihistamine or a PPI, in most cases doctors would not change it or remove it.

## Anemia

Interviewees stated that it is important to control anemia because quality of life, symptoms, and HF prognosis improve.

*It is very important to treat anemia ... anemia is a prognostic factor... and it has an extraordinary impact on patient's quality of life. When we treat anemia, patient's symptoms and quality of life improve. (#5)*

However, treating anemia is seen as an obstacle. One of the interviewees pointed out a lack of sufficient training as one of the reasons why anemia is not controlled as well as it should be. Another stated reason was its multi-factorial origin: chronic gastrointestinal blood loss plus a renal failure component was given as an example. Thus, it was admitted that many times anemia is treated empirically.

*I think that the majority of poorly controlled anemia exists because it (anemia) has a multi-factorial cause and we correct iron [levels] because they [patients] have chronic losses or because they are on anticoagulants and they are having losses in the digestive tract ... you correct one thing, but they also have renal failure, or other morbidities ... I mean, it is difficult to control all those things at the same time... (#2)*

One last proposed reason for poorly controlled anemia was the lack of effectiveness of oral treatment, related to the origin of a specific patient's anemia or due to patients' having gut edema, which limits drug absorption. However, the alternative approaches to treating anemia include drugs that require more hospital resources, such as intravenous iron, or that are very expensive, such as epoetins. In addition, according to the interviewees, there is a lack of conclusive clinical trials that support the inclusion of these therapies in the HF clinical guidelines.

*If [the anemia] gets fixed with oral iron, then it's all right. But intravenous iron treatment requires a day hospital admission and i.v. insertion. And the epos, they are expensive drugs and not always indicated ... and are shown to have important adverse effects ... (#2)*

*... concerning intravenous iron, there are very small studies ... randomized, double-blind, conclusive studies have not been reported publicly yet, although a lot of them are ongoing. (#5)*

Regarding the hemoglobin target, discrepancies existed: on the one hand some interviewees said that in a cardiac patient, moderate anemia (hemoglobin around 10 g/dl) «has more clinical relevance because it is less tolerated due to pump failure». However, others expressed that it should not be expected to achieve correct hemoglobin levels in such chronic patients:

*I think that we don't have to tolerate certain [hemoglobin] levels, but we also don't have to become obsessed with correct levels ... we don't achieve normal levels because we don't insist on trashing patients ... (#4)*

... we usually improve them [hemoglobin levels] quite a lot and maybe we don't reach optimal hemoglobin levels but ... acceptable levels are achieved. (#2)

Interviewees agreed that the differential diagnosis of anemia should be explored in a specialist setting because complementary, sometimes invasive, examinations may be needed to determine its etiology and implement specific treatment. But they also stated that follow up is difficult to perform during regular visits where there is limited time to address laboratory values in addition to the treatment of the multitude of problems that affect a HF patient (renal function, heart rate, electrocardiogram abnormalities). It was expressed that there is a lack of structural support, and a need for more staff and more time (with a special emphasis on the time needed to give explanations to an advanced age patient) to be able to cope with the complexity of HF patients. Considering that follow up may continue indefinitely and the patient may be cardiologically stable, participants suggested that the patient can be referred to a primary care physician for further evaluation.

*I think that diagnosis could be done here and follow-up should be done many times in primary care because there are a lot of patients that are compensated, the oldest ones those with multiple co-morbidities, and we keep seeing them ... because anemia follow-up is indefinite and we keep giving them appointments ... when cardiologically they are already compensated ... Either the GP or the cardiologist that visits the patient on a regular basis should do the follow up, but this shouldn't be done in the hospital clinic. (#3)*

*... in a 15 minute visit that we do, managing everything is very difficult... (#4)*

On the contrary there are types of anemia that should be treated in specialized services such as hematology, nephrology, or gastroenterology. However it was pointed out that sometimes a mild degree of anemia would not receive the importance it deserves in such specialized services. That is why interviewees said that there is a lack of clinical pathways to identify which service or center to refer them to for co-morbidity management.

*... he [other specialist] checks if the patient is very anemic; if he is not, little attention is paid to the anemia. However, we are quite concerned even if the anemia is mild. (#3)*

*Yes, the thing is that I don't know who to refer the patient to. (#1)*

## Diabetes Mellitus

Interviewees considered DM to be one of the cardiovascular risk factors that most affects the health outcomes

in these patients and, thus, it is very important to obtain adequate blood glucose control. They added that this control shouldn't be difficult to achieve.

*Absolutely. Yes, it is very important ... It is one of the most important risk factors that we have to control. Not to say the most important one ... (#5)*

*I understand that anemia may be difficult [to control], but diabetes wouldn't have to be at all ... (#2)*

It was admitted that when glycated hemoglobin is not controlled, more intensive treatment should be initiated. However, HF doctors usually don't get involved in the management of DM because it is taken for granted that it is being treated in another service or center. Some raised the issue that treating DM in a HF clinic is difficult because of the little time assigned to every patient and the already long waiting lists. It was emphasized that a HF clinic should be focused in treating HF and not co-morbidities. HF doctors added that a multidisciplinary HF clinic involving other specialists such as endocrinologists would be very well received due to the epidemic of diabetes among HF patients.

*An endocrinologist being part of it [the clinic] or as a clinic consultant that is more directly involved in this kind of patient would be ideal ... That would be great in a multidisciplinary world ... (#2)*

Interviewees said that patients should be referred to a primary care physician or endocrinologist when treatment is needed, because close follow-up will be required. Our local protocol is patient referral to primary care, because it is more accessible and includes regular nurse visits for follow-up. But some participants stated that co-morbidities are not always treated in the strict way these patients require; thus, in some cases patients have to be referred to endocrinology services. However, they were aware that it is not possible to refer all patients with elevated glycated hemoglobins to a specialist service and they feel that there is a lack of communication with that service to decide which patients to refer.

*...diabetes control, I think a GP could manage it. However, experience proves that GPs are not always as strict as needed to maintain glycated hemoglobin levels, at least in this setting, and this forces us to refer the patient to the area endocrinologist or to the hospital endocrinologist. (#5)*

## Discussion

In a previous quantitative study<sup>6</sup> we found that hyperuricemia, risk of gastric injury, anemia, and DM were common health problems poorly managed in a HF clinic. This qualitative study was designed to explore the reasons for this under-treatment and has provided answer to some questions raised:

### Should asymptomatic hyperuricemia be treated in HF patients?

High uric acid levels have emerged as an independent prognostic variable both in chronic HF<sup>9</sup> and in acute decompensated HF<sup>10</sup>. A pilot study of 50 patients treating hyperuricemia with 300 mg allopurinol significantly reduced circulating BNP levels<sup>11</sup>. Based on these promising findings, a multi-center clinical trial with oxypurinol was designed<sup>12</sup>. Several weaknesses have been attributed to this study design including: 1) Hyperuricemic and non-hyperuricemic patients were included, and the latter should not have been a population to study if the variable of interest is the hyperuricemia-prognosis relationship. 2) A dose of 600 mg of oxypurinol was used. This has a relative bioavailability equivalent to just 81 mg of allopurinol, a dose inferior to the minimum recommended initial dose (100 mg) of allopurinol. George et al.<sup>13</sup> criticized this because the dose used (600 mg oxypurinol) only reduced uric acid levels by 26%, when doses of 300 mg allopurinol achieve reductions of 44%. In the whole cohort, no clinical benefits were found; however, among patients with hyperuricemia at inclusion (108 of the total 405 patients) a tendency towards lower risk of all-cause and cardiovascular death was found to correlate with the degree of uric acid reduction<sup>12</sup>.

European HF guidelines state that HF patients are prone to develop hyperuricemia and that it confers a poorer prognosis. The guidelines recommend the use of allopurinol as a prophylactic therapy in hyperuricemia (>500 mmol/L) to prevent gout recurrence<sup>1</sup> without specifying what to do with asymptomatic hyperuricemic patients. Based on the existing results, a new study treating HF patients with hyperuricemia with standard doses of uric acid-reducing drugs is needed to obtain enough strong evidence to provide specific recommendations in HF guidelines. Until then, we believe that the signs of benefit are enough to recommend the use of a drug with such a good safety profile as allopurinol in these patients.

### Which patients on low-dose aspirin should be treated with prophylactic therapy to prevent gastric injury? Which is the first-line drug for this treatment?

Use of low-dose aspirin is associated with gastro-duodenal mucosal damage and increased risk of upper gastrointestinal (GI) bleeding. Many patients on low-dose aspirin should receive prophylactic treatment, because they often present with several risk factors that may lead to upper GI damage<sup>14</sup>. However, the routine use of proton pump inhibitors (PPI) or cytoprotective agents is not recommended in all patients taking daily doses of aspirin in the range of 75-100 mg, due to lack of randomized trials demonstrating the efficacy of such GI protective strategies in this setting<sup>15</sup>.

The risk factors for GI complications in a patient taking low-dose aspirin are not well defined. The most important factors appear to be history of ulcer, concomitant use of NSAIDs, or *Helicobacter pylori* infection<sup>16</sup>. Another risk factor that is commonly mentioned is age (65 years)<sup>17</sup>: in a study of 991 patients aged 60 years without baseline gastroduodenal ulcer at endoscopy, who were receiving aspirin 75-325 mg once daily, the use of an PPI once daily (esomeprazole, n = 493; placebo, n = 498) reduced the risk of developing gastric and/or duodenal ulcers (4% vs 1.6%,  $p = 0.0007$ ), erosive esophagitis (4.4% vs 18.3%,  $p < 0.0001$ ), and symptoms (resolution of heart-burn, acid regurgitation, and epigastric pain,  $p < 0.05$ )<sup>18</sup>. Some guidelines also state that patients with serious comorbidities such as cardiovascular diseases (CVD) should be considered a high-risk group requiring gastroprotection based on individual patient assessment<sup>17</sup>.

Omeprazole seems to be very effective in reducing both acute gastro-duodenal mucosal damage and upper GI bleeding in high-risk patients taking low-dose aspirin, whereas data for other drugs are lacking (misoprostol) or inconsistent (ranitidine)<sup>14</sup>. Still, studies to guide the choice of gastro-protective agent in patient taking low dose aspirin are limited<sup>17</sup>.

According to the existing evidence, until new studies are undertaken and recommendations are collected in HF guidelines, omeprazole should be the first option for gastroprotection in patients taking low-dose aspirin if they are also taking NSAIDs, have a history of ulcer, upper GI complications, or advanced age. This recommendation for the general population should be specially followed in HF patients, for CVD patients are considered as a higher risk population.

### Should anemia be treated as part of HF management?

Anemia is a common co-morbidity in HF and has been associated with worsening HF symptoms, reduced exercise capacity, and a double mortality risk<sup>19,20</sup>. Its correction improves shortness of breath and fatigue, cardiac function, renal function, functional capacity, quality of life, and dramatically reduces the need for hospitalization<sup>21,22</sup>. Recently, FAIR-HF trial results were published. In this study, HF patients with iron deficiency (with or without anemia) showed improvement in symptoms, functional capacity, and quality of life after treatment with intravenous ferric carboxymaltose<sup>23</sup>. These findings have suggested anemia to be a modifiable potential therapeutic target in patients with HF. However current HF guidelines provide no specific recommendation for evaluation or treatment of anemia<sup>24</sup>. Large mortality trials are in progress evaluating the effect of anemia treatment on cardiovascular patient's morbidity and mortality (Trial to Reduce Cardiovascular Events with Aranesp Therapy (TREAT)<sup>25,26</sup> and Reduction of Events with Darbepoetin-alpha in Heart Failure (RED-HF) studies)<sup>27</sup>.

Based on existing evidence, anemia should be corrected but HF clinicians express that they don't have appropriate support for the evaluation and treatment of anemia, including identifying its etiology. As far as we are concerned, treatment goals should be included in HF guidelines in consonance with their coexisting HF and pathways to refer patients should be defined, in collaboration between HF professionals and gastroenterology, hematology, and nephrology services to avoid insufficient treatment of HF patients' anemia.

### Should diabetes mellitus be treated intensively in HF patients?

The prevalence of diabetes in the HF population has increased from 13% to 25% in the last 30 years<sup>28</sup>. From et al.<sup>28</sup> found DM to be associated with a large increase in mortality in patients with HF, underscoring the importance of aggressive management of DM in these patients. However, an inverse relationship between HbA1C or glycemia levels and mortality in HF patients has been found. This so-called reverse epidemiology in patients with HF has been described for other metabolic variables such as obesity, total cholesterol, and lipoprotein levels<sup>29</sup>. Despite this, evidence-based guidelines recommend that therapies for patients with established HF include control of the metabolic syndrome<sup>30</sup>, thus patients with poorly controlled HbA1C should be better managed. As HF clinicians state that they are not able to manage co-morbidities such as DM, specific clinical pathways to refer those patients should be defined.

### Strengths and limitations

This study addresses an important and not previously studied subject. The interviews were conducted by a pharmacist (P.G.) member of the HF clinic team who was able to acknowledge some of the difficulties in the management of HF patients. This may have allowed doctors to express their own experiences with few inhibitions. The total sample strategy employed in this study ensured that a wide range of doctors' views were incorporated. These facts allowed showing the discrepancy of opinion among the different doctors that, despite working at the same clinic, had different attitudes, and thus, different behaviors, to approach the health problems studied. A potential weakness of this study may be that doctors were drawn from only one HF clinic; in other populations the prevalence of these health problems may not be the same. Another limitation of the study is that interviews took place in Spanish and were translated to colloquial English as accurately as possible. Finally, the innate limitation of qualitative methodology is that the findings cannot be generalized to other population<sup>7</sup>, adding to that the lack of triangulation that may decrease the validity of the results.

In conclusion, the findings of this qualitative study highlight a number of obstacles that specialists experience in the pharmacological management of HF co-morbidities and identified some answers to them: 1) HF specialists demand a closer interaction with other specialists, mainly with endocrinologists and nephrologists, for a comprehensive approach to these polymedicated patients with multiple co-morbidities. Along this line, there have been successful efforts to create multidisciplinary HF units incorporating other health professionals, such as nurses or pharmacists<sup>31,32,33,34,35</sup>. Future developments may include the incorporation of other specialists. 2) Specific recommendations in HF guidelines to manage these co-morbidities specifically in HF would be helpful to shed light upon the existing confusing evidence.

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