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**Changes over Time in Attitudes towards the Management of Older Patients with Heart Failure
by General Practitioners: A Qualitative Study**

Running title: Primary Care for Heart Failure in Older Patients

Qualitative Research

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Key messages:

- CHF is still underdiagnosed and undertreated in older primary care patients
- Many GPs were still unaware of the different types of chronic heart failure
- Few general practitioners initiated drug treatments and optimized dosages
- Several barriers to optimal diagnosis and management are still present
- GPs reported a lack of awareness of guidelines.
- Multidisciplinary collaboration may help GPs to change their practice

Abstract

Background: Underdiagnosis and undertreatment of chronic heart failure are common in older patients, who are usually treated by general practitioners. In 2007, the French ICAGE study explored general practitioners' attitudes to the management of this condition in older patients.

Objectives: To explore changes over time in general practitioners' attitudes towards the management of chronic heart failure in patients aged 75 and over, and to identify barriers to optimal management.

Methods: In 2015, we performed a qualitative study of 20 French general practitioners via semi-structured interviews and a thematic content analysis. The results were compared with the findings of a 2007 study.

Results: In 2015, the perceived barriers to diagnosis were the same as in 2007. Echocardiography was still the preferred diagnostic method but the general practitioners relied on the cardiologist to confirm the diagnosis. Many general practitioners were still unaware of the different types of chronic heart failure. In contrast, they reported greater knowledge of decompensation factors and the ultrasound criteria for chronic heart failure. They also prescribed a brain natriuretic peptide assay more frequently. Angiotensin-converting enzyme inhibitors and beta-blockers were more strongly perceived to be core treatments. Few general practitioners initiated drug treatments and optimized dosages. Although patient education was never mentioned, the importance of multidisciplinary care was emphasized.

Conclusion: Our results evidenced a small recent improvement in the management of older patients with chronic heart failure. Appropriate guidelines and training for general practitioners, patient education, and multidisciplinary collaboration might further improve the care given to this population.

Keywords: aging, cardiovascular disorders, continuity of care, managed care, primary care, quality of care.

Word count: 249

BACKGROUND

Chronic heart failure (CHF) affects 1% to 2% of the general population in Western countries (1), and the prevalence exceeds 10% in the over-70s (1,2). In Europe, the one-year all-cause mortality rate for CHF is 7.2% (3). A French study reported that 33% of patients hospitalized for CHF die within the following year, 40% die within two years, and 50% are re-hospitalized in the first year (4,5). The diagnosis of CHF is often missed in older patients, as the manifestations may be non-specific, atypical or apparently related to co-morbidities (asthenia, confusion, anorexia, digestive and/or sleep disorders, falls, etc.) (6). Few clinical trials have focussed on older patients with CHF (7), and most guidelines have been extrapolated from findings in younger patients (8,9). Several studies have found that CHF is underdiagnosed in older people (9,10), and that the recommended drugs are underused and/or not optimized in hospital (11-13) or primary care (14,15). Most patients with CHF are managed by a general practitioner (GP). Although a few studies have explored barriers to optimal management of patients with CHF by GPs (16-18), none has specifically investigated patients aged 75 and over. In 2007, we performed the quantitative and qualitative ICAGE study of GPs in the Ile-de-France region of France (19). The study explored the GPs' attitudes to the diagnosis and management of CHF in patients aged 75 and over. The main barriers to accurate diagnosis were found to be the presence of co-morbidities, mild or non-specific signs and symptoms, difficulties with interpreting echocardiography results, and low awareness of CHF with preserved ejection fraction (HF-pEF) vs. CHF with reduced ejection fraction (HF-rEF). Barriers to optimal management were concern about adverse drug reactions, inexperience with prescription, and inadequate knowledge of guidelines and each drug class's potential benefits. Apart from diuretics, GPs did not routinely optimize drug dosage levels, and few offered patient education or weight monitoring. Although the European Society of Cardiology (ESC) and the French Health Authority (*Haute Autorité de Santé*, HAS) both published guidelines on CHF in 2012 (updated in 2016) and 2014, respectively (1,20) (Table 1), the epidemiological context has changed little since our study in 2007 (19). Ultrasound confirmation of a diagnosis of CHF is recommended by the current guidelines (1, 20). In a study conducted in France, 95% of older CHF patients had been seen by a cardiologist (21). Chronic heart failure is still underdiagnosed and undertreated in older patients (4-6, 10,). We therefore performed a new qualitative study of French

GPs' perceptions of and attitudes to the diagnosis and management of patients with CHF aged 75 and over and compared the results with the 2007 data. We also sought to identify barriers to optimal primary care of these patients.

METHODS

Study design

The 2007 ICAGE study combined a survey of 224 GPs practicing in four counties in the Paris region (Val-de-Marne, Seine-et Marne, Hauts de Seine, and Yvelines) with 20 semi-structured interviews and two focus groups (FGs) respectively comprising 6 and 4 GPs. The group was moderated by a neutral facilitator, whereas an observer recorded and analyzed the discussion (22). The 2015 ICAGE study consisted of face-to-face, semi-structured interviews with 20 of the 224 GPs having participated in 2007. In contrast to 2007, the 2015 study did not feature FGs. Each participant provided his/her verbal informed consent. The investigating team composed two clinical psychologists, eight GPs, two cardiologists, a geriatrician, and an epidemiologist. All semi-structured interviews were moderated by an experienced GP (FL or JC). The study's methods and results were reported in accordance with the Consolidated Criteria for Reporting Qualitative Studies checklist (23).

The study sample

Twenty volunteer GPs (Table 2) were selected from the 2007 ICAGE database; the sampling was purposive, according to criteria of sex, age, type and area of practice, and participation to the ICAGE qualitative study in 2007, so as to obtain a range of points of view (26). Then, eligible GPs were mailed or phoned to participate to the study. Nine of the 20 GPs had participated in a semi-structured interview in 2007.

Data collection

All the audiotaped semi-structured interviews were held at the GPs' surgeries between February and December 2015. The mean (range) interview length was 33 minutes (20–45). The interview guide covered the same themes as in 2007: perceptions of CHF, patients with CHF, drugs for treating CHF, and the GP's professional role; attitudes to diagnosis; attitudes to treatment; knowledge of guidelines;

and training (Table 3). The interview guide was developed using Vermersch's explicitation method (24). Each GP had to select typical examples of patients aged 75 and over with CHF from among his/her patients, and he/she then commented on this and other patients while consulting the corresponding medical records. The series of interviews was terminated (after 20 interviews) when, in the interviewers' opinion, no new points of view were being produced.

Data analysis

All interviews from 2007 and 2015 were transcribed word-for-word, analyzed for thematic content by three researchers (EF, JC and FL), and compared (25). The three researchers worked independently, in order to increase inter-coder reliability (25,26). In each transcript, meaningful units were identified, grouped into major emergent themes, compared between researchers, and discussed with a fourth researcher (LM) until a consensus was achieved.

RESULTS

The following themes were identified: perceptions of CHF, older patients with CHF, drugs for treating CHF, the GP's professional role, and attitudes to diagnosis and treatment. Barriers to the effective diagnosis and management of these patients (together with similarities and differences for 2007 vs. 2015) are listed in Table 4.

Perceptions of chronic heart failure

Relative to the 2007 study, CHF was still perceived to be an insidious, slowly progressing, relatively infrequent, severe, disabling disease. The GPs viewed CHF as a frequently fatal, long-term complication of high blood pressure, myocardial ischemia, or valvular heart disease.

"Age is still the main factor in the development of CHF in patients with pre-existing cardiovascular disease (...); the cause is hypertension or cardiovascular disease." (GP19, 2007)

"Most of the time, CHF has an ischaemic cause or is linked to arterial hypertension." (GP19, 2015)

However, GPs did not perceive CHF to be an incurable, unpredictable or only age-related disease, and seemed to be more aware of cardiac decompensation factors.

“She was admitted to hospital several times for cardiac decompensation, and it was often due to either stopping treatment, forgetting to take medication, or straying from a salt-free diet.” (GP13, 2015)

Perceptions of patients with chronic heart failure

As in 2007, the older patient with CHF was perceived to have several cardiovascular risk factors and comorbidities, with frequent anxiety and/or depressive symptoms. Some patients frequently presented with cardiac decompensation, leading to hospitalization in some cases. Most patients had a long-standing relationship with their GP, although treatment compliance was variable.

“He has a history of problems: a triple bypass in 1980, ischemic heart disease, mitral regurgitation, aortic valve stenosis, and a rhythm disorder... he also has a prostate problem but it’s not cancer.” (GP11, 2007)

“This is clearly heart failure as a result of hypertension. He also has non-obstructive cardiomyopathy, COPD, drug-induced hyperuricaemia, mixed hyperlipidaemia, arthrosis, and (currently controlled) diabetes.” (GP8, 2015)

Attitudes to diagnosis

Similarly, GPs described CHF as being difficult to diagnose because of the slow onset of symptoms, the presence of co-morbidities, and the mild and/or non-specific nature of the signs and symptoms. The diagnosis was mainly based on the observation of a combination of clinical symptoms, such as dyspnoea, swollen ankles, and lung crackles.

“She was very short of breath, and it looked more like asthma because it was mostly on breathing out, and because she had a thyroid problem that generated a bit of pressure [...]” (GP13, 2007)

“She was more short of breath than usual, and presented with swollen legs and bibasilar crackles; well, it was clearly a context of heart failure.” (GP7, 2015)

However, in the present study, GPs mentioned other diagnostic signs of CHF: coughing, weight gain, and angina pectoris. Other differences (relative to 2007) concerned the use of

electrocardiography and/or a chest X-ray for detecting underlying heart disease, and the performance of electrocardiography in the GP's surgery. A brain natriuretic peptide (BNP) assay was routinely prescribed by the GPs when they suspected CHF.

"BNP is a new thing that I am not fully familiar with – of course, I can prescribe a BNP assay and compare the value with the normal range – but I'm not sure when to prescribe the assay or what to look for." (GP9, 2007)

"There's the BNP assay now; these days, we prescribe it systematically whenever there's a doubt." (GP19, 2015)

In both studies, echocardiography was the preferred technique for confirming the diagnosis of CHF. Few GPs reported that the echocardiography results provided by the cardiologist did not confirm the diagnosis, despite a strong clinical suspicion of CHF. The GPs still were unaware of the different types of heart failure; only one GP mentioned the distinction between HF-rEF and HF-pEF.

"Echocardiography ...is the core examination for diagnosing heart failure, it gives information on the heart's contractility, as well as clues to the cause of the heart failure." (GP14, 2007)

"Anyway, the patient has to have an echocardiography; you must first evidence the heart failure and then review the situation." (GP16, 2015)

"When my patient was hospitalized for heart failure, well, the final conclusion was that there was no evidence of heart failure." (GP3, FG2, 2007)

"This business of systolic or diastolic heart failure is a problem for us in practice because we can see that the echocardiographers are not up to speed on it; we have clear clinical cases of heart failure where they get back to us and say "normal left ventricle function"." (GP7, 2015)

The GPs appeared to be aware of some echocardiography criteria for CHF, such as the ejection fraction, kinetics, ventricle size, and signs of valvular heart disease. However, the GPs were not sure about the details.

"Apart from the ejection fraction, apical/septal hypokinesia or akinesia, there's... no, that's all, with LV dilatation of course." (GP14, 2015)

Perceptions of drugs for treating chronic heart failure

In both studies, diuretics were prescribed to improve quality of life or relieve symptoms (mainly during decompensation). The drugs' side effects were often reported as being responsible for non-compliance.

"The goal is to alleviate all the symptoms to the greatest extent possible, so that the patient can enjoy his life as much as possible." (GP3, FG2, 2007)

"Diuretics are more for the acute phase, to try to decrease the pressure, reduce oedema and above all reduce the pressure for the cardiac pump, in fact." (GP15, 2015)

"He had low blood pressure already and that's not very good for the kidneys, and then he fell over because of that – major orthostatic hypotension – and was hospitalized for that." (GP10, 2015)

Several GPs considered that angiotensin-converting enzyme inhibitors (ACEIs) were important for slowing disease progression but did not mention the other expected benefits. One GP stated that angiotensin II receptor antagonists were alternatives to ACEIs, citing a study. Hypotension and kidney failure were mentioned as risks associated with angiotensin II receptor antagonists and ACEIs. Spironolactone was mentioned by one GP only.

"This [ACEI] is a leading drug for heart failure." (GP14, 2007)

"They don't decompensate like that very often because they've already been treated with ACEIs [...] we know that it acts on myocardial function." (GP15, 2015)

In contrast to the 2007 results, the GPs surveyed in 2015 emphasized the central role of beta-blockers (BBs) in the improvement of cardiac function - although none mentioned the lower morbidity and mortality rates. However, adverse effects (aggravation of CHF, hypotension etc.) still meant that the GPs were reluctant to prescribe BBs.

"When I was a student not so long ago, there was this warning: 'no BBs in heart failure'. So we'll need some time to erase that message." (GP4, FG1, 2007)

"It seems to me that BBs nevertheless relieve the strain on the cardiac muscle, they slow the heart rate somewhat, ease the cardiac workload, and relieve the heart." (GP20, 2015)

Attitudes to treatment

As in 2007, most GPs prescribed diuretics while waiting for the cardiologist's diagnosis.

"In general, I initiate treatment with a diuretic if there's oedema." (GP7, 2007)

"If I hear crackles just a bit, I'll start with a little Lasilix® [furosemide] and then I'll schedule a consultation with a cardiologist." (GP3, 2015)

In 2015, the great majority of GPs referred to the combination of ACEIs and BBs as a substantive treatment for CHF. However, they still often delegated the initial prescription and optimization of ACEIs and BBs to the cardiologist.

Some GPs had adopted the concept of the maximum tolerated dose. Furthermore, a few GPs had already initiated the prescription of ACEIs and/or BBs before the consultation with the cardiologist and were able to optimize the treatment more easily during patient follow-up.

"BBs like Cardensiel® [carvedilol] (...) are usually prescribed by cardiologists (...) So, I let the cardiologist take the lead (...) -- I have no problem with letting the cardiologist decide." (GP14, 2007)

"The basis is ACEIs and BBs, and then Lasilix® [furosemide] when it's congestive heart failure" (GP14, 2015)

"The BB is for when I've got ECG data, so I'll do it later and then when I've got ECG data, I'll initiate it." (GP7, 2015)

"Well, yes, if the patient is still presenting with heart failure, I tend to increase the dose a little, to try to strike a balance between diuretics and ACEIs by using the maximum possible dose of an ACEI that does not affect renal function." (GP12, 2015)

In both studies, GPs prescribed non-pharmacological treatments (such as a low-sodium diet) but highlighted the risk of malnutrition in older patients. Most GPs did not provide or prescribe patient education; this was variously due to a lack of time, the patient's advanced age, and lack of awareness.

"You can't ask a 90-year-old to lose weight or go on a strict salt-free diet because otherwise they won't eat anything." (GP13, 2007)

"In the elderly, you can't prescribe a strict salt-free diet because otherwise they won't eat anything." (GP7, 2015)

"I don't do patient education because it's difficult to do that properly in the surgery because of the consultations... [...] in fact, I do give these patients time, but even so...." (GP9, 2015)

Most GPs stated that they were not aware of the guidelines on CHF or had not consulted them recently. This lack of awareness was variously explained by a feeling of "lassitude", a preference for having a cardiologist's opinion, lack of time for reading medical journals, and trust in advice from care networks.

"Um, no, I don't really read guidelines. No, I don't know if there are any." (GP7, 2015)

"Well, I prefer to rely on my care network, the cardiologists I work with, and the hospitals I work with." (GP5, 2015)

« [And how do guidelines help you to manage your patients?] Because they give recommendations and guidelines to be followed." (GP14, 2015)

Perceptions of the GP's professional role

In both studies, close collaboration between GPs and cardiologists was predominant during patient follow-up. The GPs and cardiologists mainly communicated by 'phone, e-mail or letter. The GPs used the 'phone to get medical advice or to arrange an appointment quickly.

"They are often followed-up by the cardiologist as well [...], it's a joint effort." (GP14, 2007)

"It's significantly based on GP-cardiologist collaboration; it's true that when someone tells you "I'll see the patient tomorrow", it's not worth sending them to clog up A&E." (GP16, 2015)

GPs perceived their role as providing a first-line diagnosis of CHF and managing cardiac decompensations as soon as possible; they still renewed prescriptions initially issued by a cardiologist, and adjusted medication levels as a function of the symptoms and side effects - particularly for diuretics.

"I do sometime increase the dose of diuretic." (GP13, 2007)

"I increase the Lasilix® [furosemide] for 3 or 4 days - I double or triple the dose when there are acute congestive episodes." (GP14, 2015)

Regarding the patient-physician relationship, the GPs provided support by monitoring treatment compliance and the treatment's effectiveness and safety.

Most GPs referred their patients with CHF to a cardiologist for echocardiography, confirmation of the diagnosis, and help in initiating drug treatment. Some GPs emphasized the cardiologist's key role in selecting the best drugs and doses, and in providing advice if the symptoms worsened.

"I think that as GPs, we need specialist advice on initiation and follow-up in cases of heart failure" (GP12, 2007)

"Well to be frank, I don't feel that I am competent to change anything, to change the treatment in heart failure, so I let the cardiologists do it." (GP3, 2015)

In contrast to 2007, the GPs emphasized the importance of multidisciplinary care – notably with regard to the nurse's role in treatment and flagging up aggravated symptoms.

"The nurse calls to prepare the pill dispenser and measure the blood pressure every morning." (GP3, 2015)

"Sometimes the nurse is the person who alerts me to the fact that the patient appears to be short of breath or that sort of thing." (GP11, 2015)

DISCUSSION

Main findings

Some improvements were reported by GPs, such as: awareness of decompensation factors, certain ultrasound criteria for CHF, the frequent use of the BNP assay, and better perception of ACEIs and beta-blockers as core treatments for CHF. A few GPs reported initiating drug treatments and/or optimizing dosage levels on a routine basis. Although patient education was never mentioned, GPs highlighted the importance of the nurse's role. However, no change was observed since 2007 for perceived barriers to diagnosis, such as co-morbidities, and the mild, non-specific nature of the symptoms. Echocardiography was still the preferred diagnostic method, and was performed by the cardiologist. The GPs relied on the cardiologist to confirm the diagnosis, and many were still unaware of the different types of CHF. Other barriers to optimal management involved concerns about adverse drug reactions, lack of prescribing experience, the perceived complexity of prescription, and insufficient knowledge of the guidelines and each drug class's potential benefits (especially with regard to morbidity and mortality).

Strengths and limitations

The present study's strengths include face-to-face interviews led by an experienced GP moderator, the collection of data at different times and from different people, and coding of the results by three independent investigators. We decided to include some GPs who had not participated in the qualitative 2007 study in order to account for a potential Hawthorne effect, although the latter's effect decreases over time. The interview topic guide was developed using Vermersch's explication method, in order to encourage the production of specific details rather than statements of assumptions. The ease of access to cardiologists and echocardiographers in our region might limit the broader applicability of our findings. Nevertheless, this potential bias was limited by the fact that 6 of the 20 GPs (30%) worked in rural or semi-rural areas. Although self-selection bias is a possibility, other studies have reported similar findings (16,18,27).

Comparison with the literature

In keeping with our results, a recent study reported that the management of CHF had changed little; however, the study did not focus on the older patients (18). As reported in previous studies, we found that barriers to optimal diagnosis still involve non-specific symptoms and clinical signs - particularly with several comorbidities (7, 11, 12, 27). In keeping with other findings, prescription of a BNP assay by GPs increases over time (18,28). A cross-sectional study published in 2003 reported that only 5% of British GPs considered BNP to be useful in diagnosis, whereas a study published in 2012 found that 58% of Danish GPs prescribed a BNP/NT-proBNP assay when they suspected CHF (28,29). We found that GPs preferred to refer patients to a cardiologist for confirmation of the diagnosis (18). In contrast to other studies, access to echocardiography (performed by cardiologists in France) may not be a barrier to the diagnosis of CHF (18). Even though diuretics are most frequently prescribed by GPs, the role of ACEIs and BBs in treating CHF now appears to be better understood (27). Although few GPs initiated and/or optimized drugs especially for ACEIs, studies report that the initiation and dosage optimization of ACEIs and BBs is still rarely handled by GPs, who delegate these prescriptions to cardiologists (18,27,28). The barriers to the prescription of ACEIs and BBs have not changed: the fear of side effects, the long-known contra-indications for BBs, low awareness of HF-rEF vs. HF-pEF, and poor knowledge of the drugs' likely benefits (18,30). Lastly, and although patient education is

known to improve quality of life and reduce CHF-related hospitalization, mortality and costs (31), it was never mentioned by our GPs - as was the case in other studies (16,17,18,27).

Implications for clinical practice

Our findings emphasize that the diffusion and the use of guidelines alone hardly changes medical practice (32). Moreover, none of the guidelines on CHF in older patients specifically address a GP's everyday practice. A report on improving CHF guideline implementation by GPs mentioned application-oriented training of a physician's procedural knowledge and skills, and the availability of tools (such as patient information leaflets) and patient education (33). Interventions like clinical pathways, multidisciplinary teams, and multifaceted interventions appear to increase guideline uptake most consistently (34). Dialogue with the cardiologist could help the GP to implement guidelines and choose the right treatment strategy. Continuing medical education has a moderate impact on improving medical practice (32,34). Moreover, GPs trained in patient education feel more effective when treating patients with chronic disease (35). Lastly, multidisciplinary management has proved its efficacy in reducing CHF-related and all-cause hospitalizations and mortality (36-38). In these studies, multidisciplinary team included medical input plus one or more of the following: specialist nurse, pharmacist, dietician, or social worker who exercise in hospital or in primary care team. Multidisciplinary interventions included provision of home visits with nurse-led patient education, home physiological monitoring, televideo link and/or telephone follow up. Older patients with CHF and other chronic diseases might benefit from a personalized care plan (39,40). Multidisciplinary management can improve patient care pathways and should be based on close collaboration and good communication between health providers. Better organization of care provision might allow GPs to attend courses on CHF and to participate more in multidisciplinary care.

CONCLUSION

Between 2007 and 2015, GPs in the Ile-de-France region reported few changes in the management of older patients with CHF; this finding is consistent with epidemiological data on underdiagnosis and undertreatment in this patient population. Although there were some improvements, most of the barriers to optimal diagnosis and management are still present. The application of guidelines alone appears not to significantly change GPs' practice. Other interventions (such as multidisciplinary

collaboration with cardiologists and nurses, patient education, and better medical education) might help GPs to deal with individual barriers and change their practice. These actions means that we have to think differently about CHF and care provision in elderly patients.

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Declaration section : This article had 3588 words with verbatims (and 2558 without) and 54 references and was reviewed. Now, there is 2724 words without verbatims (our results) and 3674 words with verbatims after adding changes following request of reviewers. Moreover, reviewers request us to add some references, therefore now and after the removal (we remove 11 references) of some references the count is 44 references but take into account the reviewers comments.

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Table 1. Key points from the guidelines on chronic heart failure issued by the European Society of Cardiology (ESC 2012, updated in 2016) and the French Health Authority (*Haute Autorité de Santé*, HAS, 2014).

Theme	European Society of Cardiology 2012 (updated in 2016)	French Health Authority 2014
Definitions of chronic heart failure	<ul style="list-style-type: none"> • 2012: - Heart failure with: <ul style="list-style-type: none"> - preserved ejection fraction (EF>40-50%) - reduced ejection fraction (EF<40-50%) • 2016: Heart failure with: <ul style="list-style-type: none"> -preserved ejection fraction (ejection fraction (EF≥50%) -mid-range ejection fraction (40≤EF<49%) -reduced ejection fraction (EF<40%) 	<ul style="list-style-type: none"> • Heart failure with preserved ejection fraction (EF>40-50%) • Heart failure with reduced ejection fraction (EF<40-50%)
Clinical diagnosis	<ul style="list-style-type: none"> • ESC 2012 and 2016: Non-specific signs, such as asthenia, confusion, cough, and falls 	<ul style="list-style-type: none"> • Non-specific signs, such as asthenia, confusion, cough, and falls
Initial investigations	<ul style="list-style-type: none"> • 2012: two diagnostic strategies: <ul style="list-style-type: none"> -clinical signs and echocardiography -clinical signs and BNP. Echocardiography is used to confirm the diagnosis if the BNP is over 35 pg/ml. • 2016: Measure the BNP level immediately • Echocardiography to confirm the diagnosis, determine the aetiology, and start appropriate treatment 	<ul style="list-style-type: none"> • Measure BNP if the diagnosis is uncertain • Echocardiographic confirmation of the diagnosis
Drugs for treating chronic heart failure and treatment approaches	<ul style="list-style-type: none"> • Emphasis on ACEIs and BB for reducing mortality and morbidity • ACEIs should be up-titrated to the maximum tolerated dose • Diuretics are recommended for reducing the signs and symptoms of congestion • Multidisciplinary team management for reducing morbidity and mortality and improving quality of life 	<ul style="list-style-type: none"> • ACEIs and BBs as the first-line treatment for CHF • ACEIs should be up-titrated to the maximum tolerated dose • Diuretics are recommended for reducing the signs and symptoms of congestion • Patient education and multidisciplinary management may reduce morbidity and mortality and improve quality of life

Table 2. Comparison of the characteristics of the general practitioners included in the 2007 and 2015 ICAGE studies

Characteristic	2015 ICAGE study n = 20	2007 ICAGE study n = 20
Male sex (%)	12 (60)	12 (60) ^{ns}
Age (years)	55 [39-62]	51 [33-57] ^{ns}
Years in practice	25 [10-36]	26 [4-33] ^{ns}
County of practice (%)		
Seine et Marne	5 (25)	5 (25) ^{ns}
Yvelines	3 (15)	3 (15) ^{ns}
Hauts de Seine	4 (20)	4 (20) ^{ns}
Val de Marne	8 (40)	8 (40) ^{ns}
Practice in a health centre (%)	14 (70)	9 (45) ^{ns}
Practice in a nursing home (%)	8 (40)	9 (45) ^{ns}

Qualitative data are quoted as the n (%), and quantitative data are quoted as the median [range].

ns: non-significant in Student's t-test

Table 3. Guide for the semi-structured interviews used in the two ICAGE study periods

Questions*

The patient

- Can you tell me about Mr/Mrs X?
- How do you view them? What are they like? How do you feel about them?

The disease

- Can you tell me how Mr/Mrs X was first diagnosed with CHF?
- Was there enough information to make the diagnosis? Were the signs and symptoms suggestive of another disease? How do you make a differential diagnosis on the basis of these symptoms?

Diagnosis

- In elderly patients in your practice, what makes you suspect heart failure?
- How do you confirm a diagnosis of CHF? What techniques and information do you use? Who (if anyone) helps you with the diagnosis? Do you encounter any difficulties or uncertainty?

Treatment

- How do you treat elderly* patients with CHF? What treatments do you prescribe? Who helps you with the treatment? How do you proceed?
- Do other professionals help you to monitor Mr/Mrs X? If so, what are their roles?
- What is your role as a GP in Mr/Mrs X's follow-up?

Guidelines and continuing medical education (theme added in the 2015 study)

- Are you aware of any guidelines on CHF? If so, how did they help you to manage Mr/Mrs X? If not, how would guidelines on CHF be useful in your daily practice?
- Have you ever attended a training course on CHF? If so, how did this continuing medical education change your practice? If not, how would continuing medical education be useful in your daily practice?

* The patients with CHF aged 75 and over being discussed here were identified by the GP respondent using Vermersch's explicitation method.

Table 4. Changes over time in barriers to the diagnosis and effective management of chronic heart failure in older patients between 2007 and 2015

Theme	Similarities when comparing the two study periods	Changes/differences
Perception of the disease	<ul style="list-style-type: none"> • CHF is perceived as an insidious, slowly progressing disease • Lack of knowledge about types of CHF 	<ul style="list-style-type: none"> • Better knowledge of decompensation factors
Perception of the patients	<ul style="list-style-type: none"> • Older patients have several disorders and comorbidities • Older patients have frequent episodes of cardiac decompensation • Older patients vary in their independence and adherence 	<ul style="list-style-type: none"> • Older patients understand more about their disease
Attitude to diagnosis	<ul style="list-style-type: none"> • Mild and/or atypical symptoms and signs • Echocardiography was still the preferred method for confirming the diagnosis of CHF • GP/cardiologist collaboration is common 	<ul style="list-style-type: none"> • Other diagnostic signs for CHF were mentioned: cough, asthenia, weight gain, and angina pectoris • A BNP assay is usually prescribed • Some GPs are familiar with some of the echocardiography criteria for CHF but not precisely
Perceptions of drugs for treating chronic heart failure and treatment approaches	<ul style="list-style-type: none"> • Diuretics improve symptoms but are associated with a risk of side effects • Diuretics are often prescribed by GPs while waiting for advice from the cardiologist • ACEIs constitute a cornerstone treatment for CHF • GPs fear adverse drug reactions to ACEIs and BBs • Prescriptions of ACEIs and BBs are mostly delegated to the cardiologist • GPs fail to use patient education • GPs are often unaware of guidelines on CHF 	<ul style="list-style-type: none"> • Few GPs initiated and/or optimized the dosage levels of ACEIs • The ACEI/BB combination is perceived to be a substantive treatment for CHF, and few GPs would initiate the prescription • The “maximum tolerated dosage” concept was mentioned
Professional role	<ul style="list-style-type: none"> • The GP has a role in diagnosis, follow-up and diuretic prescription • GP/cardiologist collaboration continues during patient follow-up • The cardiologist’s role is to confirm the diagnosis and initiate treatment with ACEIs and BBs 	<ul style="list-style-type: none"> • The nurse’s role in multidisciplinary management was further emphasized