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Consultation between specialists in Internal Medicine and Family Medicine improves management and prognosis of heart failure

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Abstract

Background and objective: To evaluate if consultation between specialists in Internal Medicine and family doctors (CIMFD) improves the clinical management and prognosis of patients with heart failure (HF).
Methods: Design: prospective case-control study (5 years of follow-up). *Setting:* community-based sample within the area of a university teaching hospital. *Subjects:* 1857 patients (>= 14 years) diagnosed for the first time with HF (1stDxHF), in the CIMFD. Control group: 1981 patients (from health centres not covered by the CIMFD), 1stDxHF, in the external consultations of the hospital. *Main outcome measures:* mortality rate (MR). Admissions (HA). Emergency services visits (ESV). Delays in receiving specialist attention (DRSA), and the resolution of the process (DRP). Number (NTP) and delays in reporting (DTP) tests performed. Proportion (PRC) and delay (DRC) in resolving cases.
Results: We observed a reduction of: MR (by 10.8%, CI 95%, 8.6–13.0, $p < 0.005$); HA, per patient per year (ppy) (by 1.8, 1.3–2.3, $p < 0.01$); ESV, ppy (by 1.9, 1.2–2.6, $p < 0.01$); DRSA (by 26.5 days, 21.8–31.2, $p < 0.001$); DRP (by 21.0 days, 18.3–23.7, $p < 0.001$), and DRC (by 25.8 days, 20.3–31.4, $p < 0.01$). The PRC (17.2%, CI 95%, 15.5–18.9, $p < 0.01$) was higher for the CIMFD.
Conclusion: The CIMFD approach improves prognosis and efficacy in the clinical management of patients with HF because it reduces mortality and morbidity (HA and ESV), shortens the delays in receiving care and in resolving the diagnostic and therapeutic process (DRSA, DRP, DRC), and increases the proportion of diagnosed and treated patients.

Keywords: Heart failure; Disease management; Case management; Patient care management

1. Introduction

Heart failure (HF) is a common and serious disease that accounts for high healthcare and social costs [1–7]. Continuity of care is a critical aspect in the clinical management of chronic diseases, especially in the case of older persons with serious comorbidity, as in patients with HF. One of the weaknesses of the national health system in Spain is a lack of coordination generally existing between primary care and hospital attendance [8]. The aging of the population creates situations where patients suffering diverse conditions are customarily seen by several different specialists (leading to fragmentation in respect of entities and equipment) [9], who may sometimes consult with other specialists (leading to cross referrals) [10], to the repetition of tests [11,12], to the prescription of several different medications (polymedication), to repeated patient journeys to the hospital, and, in general, to the perception of disorganization and poor quality by the patients [13–16].

The family doctors (FDs), despite having the training necessary to resolve the great majority of the health problems of their patients, are sometimes limited by not having access to the appropriate complementary tests relevant to these problems

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[9–25]. Hospital external (out-patient) consultations are overloaded by the large number of patients who need to be attended [12,17–19,21].

The consultation between internists and family doctors (CIMFD) is an innovatory approach to organising care that not only improves its efficacy in comparison with that of the classic model of consultation with specialized attention, but also facilitates epidemiological research into the causes and clinical management of medical processes. In previous studies we have shown that it is possible to improve the efficacy of care in patients who are referred from primary care to an appointment with a specialist, by means of joint patient consultations with internists and family doctors [26,27]. From those findings we assume that the CIMFD approach would improve the efficacy of medical attention for patients with chronic heart failure (CHF). To test for this hypothesis, we have designed a prospective study of cases and controls to compare the efficacy of the consultation of Internal Medicine with that of a simultaneous control group of patients with CHF who have been referred to an external consultation of the hospital under the customary system.

2. Methods

2.1. Organisation of the CIMFD

All the patients referred by their FD to a specialist consultation of any of the medical specialities (Cardiology, Gastroenterology, Internal Medicine, Infectious Diseases, Nephrology, Neurology, Pulmonology or Rheumatology) of the University Hospital Puerto Real (HUPR), are seen jointly and at the same medical appointment (at the Health Centre where the FD is based), by their FD and a consultant internist (CI), who attends the Centre once a week. The patient consultations jointly with an internist and the family doctor are currently taking place at three health centres, covering a total of 87,016 inhabitants. A total of 69 family doctors based at the three health centres mentioned, and 6 specialists in Internal Medicine assigned to the Internal Medicine Service of the HUPR participated. A detailed description of the CIMFD has been previously published [26,27].

2.2. Study design

A prospective study of cases and controls over a period of 5 years (1 January 2002 to 31 December 2006), with the aim of assessing the efficacy of organised consultation between hospital internists and family doctors for the attention to patients with CHF, in comparison with the efficacy of the traditional system of specialist consultations requested from primary care and performed exclusively in the hospital.

2.3. Study group

All the patients (>= 14 years) attended under the CIMFD system and diagnosed for the first time with CHF (by the Framingham criteria) during the period of study (1857 patients).

2.4. Control group

Sample of 1981 patients (>= 14 years) diagnosed for the first time with CHF, taken from the total of the patients attended in the external consultations of the HUPR (10,666) during the period of study. These patients originate from health centres not included in the CIMFD system. The patients of the control group were selected randomly and matched for age, sex and comorbidity with the patients of the study group. The patients and controls were included prospectively. This study has been undertaken with the approval of the Committee for Ethics,

Table 1
Characteristics of the patients diagnosed with heart failure (HF) by consultation between specialists in Internal Medicine and family doctors (CIMFD) and by the external consultations of the hospital (CONTROL)

	CIMFD (n=1.857)	CONTROL (n=1.981)	p
Age	74.8±14.8	73.5±13.4	n/s
Females	76.4±12.5	76.7±13.6	
Males	71.6±13.8	71.4±12.5	
Sex			n/s
Female (No./%)	984 (53)	1030 (52)	
Male (No./%)	873 (47)	951 (48)	
Ecocardiography (No./%)	1801 (97)	1823 (92)	n/s
Time since Dx (days):			<0.01
Clinical	10.5±6.6	37.6±19.7	
Ecocardiograph	22.6±11.9	43.6±16.7	
Type of HF: (No./%)			n/s
Systolic (LVEF<50)	984 (53)	1091 (55)	
Non systolic (LVEF>50)	799 (43)	812 (41)	
Others	74 (4)	80 (4)	
Valvular disease+LVEF<50	18 (1)	34 (1.7)	
LVEF<36 (No./%):	260 (14)	337 (17)	n/s
LV Hypertrophy (No./%):	594 (32)	614 (31)	n/s
Etiology of the HF (No./%):			n/s
Ischemic (Angina or AMI)	929 (50)	1010 (51)	
Hypertension	799 (43)	792 (40)	
Valvular	56 (3)	75 (3.8)	
Others	75 (4)	69 (3.5)	
Ischemic+AHT	520 (28)	515 (26)	
Comorbidity (No./%):			<0.05
Angina	501 (27)	574 (29)	n/s
AMI	539 (29)	614 (31)	n/s
Coronary interv'n	427 (23)	416 (21)	n/s
CVA	111 (6)	40 (2)	<0.05
Peripheral ischemia	204 (11)	139 (7)	n/s
Diabetes mellitus	594 (32)	475 (24)	<0.05
Hypertension	891 (48)	832 (42)	n/s
C. renal failure (Cr>1.5 mg/dL)	223 (12)	119 (6)	<0.01
COPD	130 (7)	59 (3)	<0.01
Chronic hepatopathy	74 (4)	12 (0.6)	<0.005
Dementia	56 (3)	6 (0.3)	<0.001
Others	55 (3)	40 (2)	n/s
>2 Comorbidities	929 (50)	733 (37)	<0.01
Females (No./%)	446 (24)	337 (17)	
Males (No./%)	483 (26)	396 (20)	
Charlson Index	2.4±1.3	1.1±0.5	<0.01

LVEF: Left ventricular ejection fraction; LV Hypertrophy: Left ventricular hypertrophy; AMI: Acute myocardial infarction; Coronary interv'n: Previous coronary intervention (percutaneous or surgical); CVA: Cerebro-vascular accident; C. renal failure: Chronic renal failure; Cr.: Creatinine; COPD: Chronic obstructive pulmonary disease.

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2.5. Collection of data and study variables

Data was collected in respect of the following variables: the Health Centre, patient affiliation, sociodemographic data, the Family Doctor of the patient, clinical data and the problem consulted, data and variables referring to the tests requested before the CIMFD, treatment received prior to the specialist consultation, data and variables referring to the tests requested under the CIMFD, the definitive diagnosis, the treatment decided and administered, length of time until resolution of the problems, mortality, visits to emergency services (hospital and health care centre) and admissions of the patient, where applicable.

To assess the degree of satisfaction of the patients, a previously-validated telephone survey (25–28) was conducted of a sample of 214 patients selected randomly from among the 1857 patients diagnosed with CHF in the CIMFD; a similar survey was made of the 69 FDs who participated.

2.6. Statistical analysis

No losses were recorded of patients initially included in the study; all the patients of both groups attended their appointments to receive the results of the tests requested after the first visit. The patients who did not present for the first appointment have been computed for all purposes (intention to treat), and to determine the proportion of non-attendance (inefficiency).

The data are expressed in absolute and relative values, utilising measurements of central trend (means) and dispersion (standard deviation). The continuous variables with normal distribution are expressed as means and standard deviations, and the values for the study group have been compared with those for the control group using the Student t test. When these variables do not present a normal distribution, the Mann–Whitney test is employed. The categoric variables are expressed as percentages or frequencies, and have been compared using the X^2 of Pearson. The 95% confidence intervals have been determined. For all the tests, the results have been considered significant for a CI of 95% and a P value of less than 0.05. All the analyses were performed with the SAS software version 9.13 (SAS Institute Inc, Cary, NC) [28].

3. Results

The characteristics of the patients included in the study group (CIMFD) and in the control group are given in Table 1. There were no significant differences in age or sex, in the type of HF (LVEF < 50% vs. LVEF >= 50%), in the rates of HF with LVEF < 36% or with left ventricular hypertrophy, and in the etiology of the patients with HF included in the two groups. The patients attended in the CIMFD presented more comorbidity and a higher Charlson Index than those of the control group.

Table 2 summarises the tests most frequently requested by the family doctors before referring to a specialist consultation. This table also shows for the two groups the mean delay in reporting the results of the tests to the patient, the mean number of tests requested per patient, and the proportion of patients for whom the family doctors requested one or more tests before referring them to a specialist consultation. No differences are appreciated in the mean delay in informing patients of the result of the tests requested by the FD before referral to the specialist consultation, or in the mean number of tests per patient or the proportion of patients having tests.

The delay experienced by patients in receiving specialist attention was considerably less by 26.5 days (CI 95%, 21.8–31.2 days, $p < 0.001$) for the patients attended under the CIMFD system (4.7 ± 0.06 days), in comparison with the delay for patients attended under the usual system of referral (26.8 ± 0.23 days).

Table 3 gives details of the tests requested most frequently by the specialists for patients with CHF, comparing patients attended under the CIMFD system with those seen under the usual system in the HUPR. This table also indicates the delays in reporting test results to the patients, the mean number of tests performed per patient, and the proportion of total patients for whom the specialists requested tests.

The mean delay in reporting to patients the result of the tests requested by the specialists was 21.0 days (CI 95%, 18.3–23.7 days, $p < 0.001$), and the mean number of tests performed per patient was 0.9 (CI 95%, 0.3–1.5 $p < 0.01$); both measures were notably lower for the CIMFD group. No appreciable differences are seen in the proportions of patients having tests.

Table 2
Tests requested by the Family Doctor before requesting a specialist consultation for the patient, either jointly with a specialist in Internal Medicine (CIMFD) or through the external consultations of the hospital (CONTROL)

	CIMFD(n=1857)			CONTROL (n=1981)			p
	No.	(%)	Delay (days) Mean (SD)	No.	(%)	Delay (days) Mean (SD)	
Analytical	1783	96	8.7 (1.3)	1803	91	8.3 (1.1)	n/s
Thorax X-ray	1781	96*	4.3 (0.6)	1565	79*	4.7 (0.7)	<0.01
ECG	1820	98*	0.7 (0.1)*	1426	72*	3.6 (0.5)*	<0.005
SPirometry	130	7	2.7 (0.4)*	178	9	9.8 (1.5)*	<0.05
Consultations	56	3*	22.7 (2.9)*	357	18*	47.8 (5.3)*	<0.001
Total	5689		10.8 (5.1)*	5507		11.2 (8.7)*	n/s
Tests/Patient	3.1 ± 1.4			2.8 ± 1.3			n/s
Patients having tests (%)	98			92			n/s

Min.: Minimum. Max.: Maximum. Thorax X-ray: Radiography of the thorax. ECG: Electrocardiogram.

Table 3
Tests requested by the specialist, either in the patient consultation jointly with the specialist in Internal Medicine and the family doctor (CIMFD) or in the external consultation of the hospital (CONTROL)

	CIMFD (n=1857)			CONTROL (n=1981)			p
	No.	(%)	Delay (days)Mean (SD)	No.	(%)	Delay (days)Mean (SD)	
Analytical	392	10*	9.6 (1.6)**	1941	98*	36.9 (6.8)**	<0.001
Echocardiograms	1801	100	23.5 (3.4)	1842	93	18.9 (2.1)	n/s
Exercise test	371	20*	36.3 (6.1)**	594	30*	15.7 (1.9)**	<0.01
Nuclear med.	353	19*	31.2 (3.7)**	238	12*	49.6 (9.3)**	<0.05
Non-cardiac echo	464	25*	22.6 (2.8)**	139	7*	48.9 (8.8)**	<0.01
CAT	279	15	26.2 (3.7)**	317	16	56.6 (10.4)**	<0.01
NMR	61	3.3	6.8 (0.5)	99	5	6.2 (0.3)	n/s
Consultations	111	6*	22.7 (2.7)**	396	20*	49.8 (9.0)**	<0.005
Others	279	15	14.3 (1.4)**	376	19	36.3 (5.9)**	<0.05
Total	3931		17.2 (3.6)*	5.957		38.2 (6.4)*	<0.001
Tests/Patient	2.1±1.2			3.0±1.4			<0.01
Patient having tests (%)	100			100			n/s

Min.: Minimum. Max.: Maximum. Nuclear Med: Nuclear medicine tests. Non-cardiac Echo: Non-cardiac echography. CAT: Computerised axial tomography. NMR: Nuclear magnetic resonance.

Table 4 summarises the resolution of the patient attendance process in the study group compared with the control group. The mean delay in establishing the diagnosis and deciding the treatment of these patients under the CIMFD approach is 25.8 days less (20.7 vs 46.5 days) than that for patients of the control group (CI 95%: 20.3–31.4 days, $p < 0.01$) (Fig. 1).

The proportion of cases resolved (diagnosed and treated) under the CIMFD system is 17.2% more (82% vs 65%) than those resolved under the classic referral system (CI 95%: 15.5–18.9%, $p < 0.01$) (Fig. 2). Under the CIMFD system the proportion of patients discharged, 46.0% (CI 95%: 41.7–50.3%, $p < 0.001$) is also higher, both on the first visit (3.9%, CI 95%: 3.3–4.5%, $p < 0.01$) and on the second, after reception of test results (42.4%, CI 95%: 37.6–46.8%, $p < 0.001$). Conversely, under the CIMFD, the proportion of cases pending resolution (17.1%, CI 95%: 14.7–19.5%, $p < 0.005$), the proportion of referrals to other specialities (cross-referrals) (39.2%, CI: 35.5–42.9%, $p < 0.001$), and the proportion of specialist check-ups (25.0%, CI: 20.3–29.7%, $p < 0.01$) are lower than for the control group (Table 4 and Fig. 2).

During the 5 years of monitoring from the date of diagnosis of CHF, the patients attended under the CIMFD had fewer numbers per annum of urgent visits to either the hospital or to their health centre (mean 1.9, CI 95%: 1.2–2.6, $p < 0.01$), of admissions (mean 1.8, CI: 1.3–2.3, $p < 0.01$), and a lower mortality rate (10.8%, CI 95%: 8.6–13.0%, $p < 0.005$), than those of the control group.

The degree of satisfaction with the CIMFD system expressed by both the patients and the FDs was very high. All the patients located (214) responded the telephone interview. Of those patients surveyed, more than 85% (CI 95%: 79–98%) considered as excellent or very good the time elapsed for receiving specialist attention, the clarity and scope of the explanations received in respect of their process, of the tests requested for their study, the

Table 4
Resolution (diagnosis and treatment) of the patients with heart failure, by the joint consultation with the specialist in Internal Medicine and the family doctor (CIMFD), or through the external consultations of the hospital (CONTROL)

	CIMFD (n=1857)		CONTROL (n=1981)		p
	No.	(%)	No.	(%)	
Cases resolved	1523	82	1288	65	<0.01
Discharges 1st visit	93	5	20	1	<0.01
Discharges 2nd visit	892	48	119	6	<0.001
Admissions	204	11	297	15	n/s
Referrals	334	18	852	43	<0.001
Internal Medicine	260	14	60	3	<0.005
Cardiology	37	2	119	6	<0.01
Other medical specialities	168	1	594	30	<0.001
Other non-medical specialities	19	1	79	4	=0.01
Cases pending	234	18	693	35	<0.01
Check-ups	984	53	1545	78	<0.01
Delay (days)	20.7±6.3		46.5±11.2		<0.01

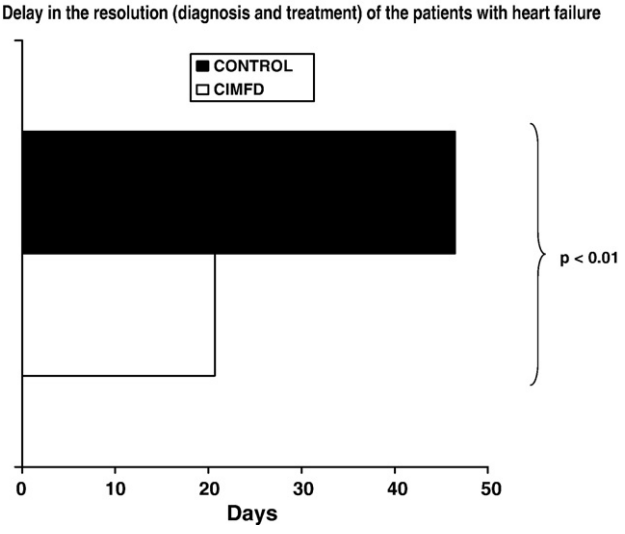

Fig. 1. Delay in the resolution (diagnosis and treatment) of the patients with heart failure, by the joint consultation with the specialist in Internal Medicine and the family doctor (CIMFD), or through the external consultations of the hospital (CONTROL).

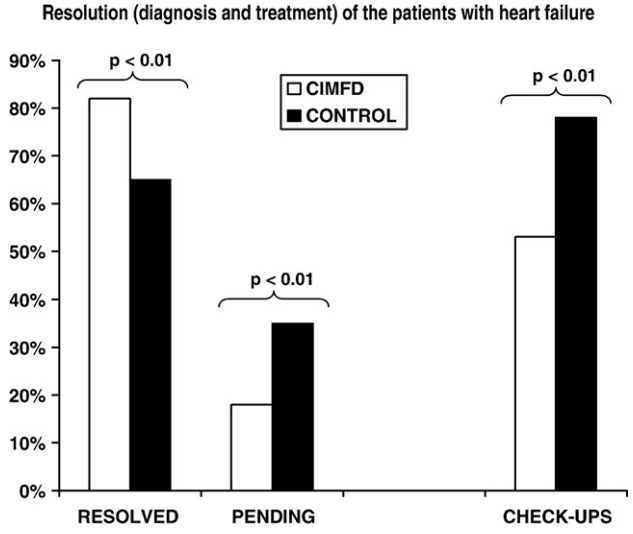

Fig. 2. Resolution (diagnosis and treatment) of the patients with heart failure. Rate (percent) of patients with heart failure resolved (diagnosed and treated), and rate (percent) of check-ups by the joint consultation with the specialist in Internal Medicine and the family doctor (CIMFD), or through the external consultations of the hospital (CONTROL).

interest shown by the consultant internist in their case, in listening to and understanding their signs and symptoms, and the treatment subsequently received. Most of the patients (89%, CI 95%: 80–98%) considered that the consultation had contributed to the improvement or relief of their process. The overall assessment of the CIMFD system by the patients was excellent or very good in 87.4% of cases (CI 95%: 81.2–93.6%), and 93% (CI 95%: 89–97%) of the patients surveyed would recommend this type of consultation to other persons.

In respect of the family doctors, 91% of participating FDs (63 out of 69) completed the anonymous survey of satisfaction. More than 85% (CI 95%: 78–99%) of them considered that the clarity and scope of the explanations received from the consultant internist on the process of their patients, on the tests requested for their study, on the treatment to be administered, the accessibility of the consultant internist, the willingness to listen to and understand their proposals, and the cooperation shown had been excellent or very good. The overall satisfaction was excellent or very good for 92% of the FDs (CI 95%: 83–99%).

4. Discussion

Studies have demonstrated that the quality of care improves in line with improved coordination between primary and specialist care [9,17–20,22–24]. In previous studies we have observed that greater efficacy can be achieved in specialised attention, through this CIMFD approach to joint consultation between internists and family doctors [26,27].

The present prospective study is designed to evaluate the efficacy of the joint consultation between internist and family doctor in the attention to and prognosis of patients with HF. This approach achieves a clear reduction in mortality, the number of visits to Emergency services, the number of admissions, the mean delay in receiving specialist attention, the mean number of patient tests requested in the attention by the specialist, the mean delay for the patient in receiving the results of the tests requested by the specialist, the mean delay in the resolution of the diagnosis and therapeutic process, the mean number of cross-referral between specialities, and the mean number of check-ups by specialised attention. The rate of resolution of the processes and rate of discharges were significantly higher for the CIMFD approach, in comparison with the classic system of referral from primary care to the hospital.

The demographic characteristics of the patients with HF in our health centres (a slight preponderance of women, with greater mean age in comparison with the men), the type of heart failure (54% with systolic HF), the etiology of the heart failure (51% had ischemic cardiomyopathy and 42% were hypertensive), and high comorbidity (43% of them presented at least three different diseases, with a high Charlson Index) match reasonably well those described in the majority of previous populational studies of heart failure [1–6,29–36]. For this reason, the results of our study reflect normal clinical practice more closely than others from the majority of clinical trials, which include selected groups of patients with low comorbidity [3,31,37–48].

We have observed rates of referral to specialist medical consultations that are similar to those reported in other studies [13,15,24,25,49–57]. However, the waiting time to receive specialised attention and the time elapsed between the referral and the transmission to the patient of the results or information observed from the CIMFD are very much less than those delays previously reported [18,24].

The CIMFD system has several advantages. Patients can be precociously diagnosed and treated for serious diseases, like heart failure, before being admitted for decompensation. Because the CIMFD consultations evaluate all the patients that the family doctors refer to consultations with a specialist, studies of epidemiological and clinical cohorts can more easily be conducted. Yet another strength of the CIMFD approach is the learning environment that it establishes.

The main limitations of our study derive from its observational nature, since a clinical trial design would have assumed some inefficiency in care and attendance, and would have been difficult to maintain in ethical terms for the patients assigned randomly to the control group. For this reason a prospective study of cases and controls was designed, using a control group that we endeavoured to make statistically comparable with the intervention group. The demographic characteristics, the comomorbidity, and the treatment do not differ significantly between the study and control groups. Equally, the resource in terms of FDs for the control group, not only in number and work load but also in their professional profile, is similar to that of those FDs assigned to the health centres that constitute the CIMFD study group. Patient satisfaction was not assessed in the control group. Nevertheless, most patients in the intervention group (92%) have previously been exposed to the classic model of consultation with specialized attention. The satisfaction survey included several questions comparing the CIMFD with the classic model of consultation.

In conclusion, in comparison with the traditional system of referrals to the external consultations of the hospital, this cooperative type of local consultation between specialists in Internal Medicine and Family Medicine improves the prognosis and the efficacy of attention to patients with chronic heart failure: it reduces mortality, visits to Emergencies, and hospital admissions; it shortens the waiting time for medical attention and for the resolution of the diagnosis and therapeutic process; it also reduces the number of diagnostic tests requested and the number of check-ups needed. The patients to whom it has been applied over the five-year trial report a high level of approval.

5. Learning points

- The consultation between specialists in Internal Medicine and family doctors (CIMFD) approach improves prognosis and efficacy in the clinical management of patients with heart failure because it reduces mortality and morbidity (hospital admissions and visits to Emergency services), shortens the delays in receiving care and in resolving the diagnostic and therapeutic process, and increases the proportion of diagnosed and treated patients.

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References

[1] Hunt SA, Abraham WT, Chin MH. AAC/AHA 2005 Guideline update for the diagnosis and management of chronic heart failure in the adult-summary article: a report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines. Circulation 2005;112:1825–52.

[2] Swedberg K, Cleland J, Dargie H. Guidelines for the diagnosis and treatment of chronic heart failure. Eur Heart J 2005;26:115–40.

[3] McMurray JJV, Pfeffer MA. Heart failure. Lancet 2005;365:1877–89.

[4] Nice Guidelines. Chronic Heart failure. National Clinical Guideline for the diagnosis and management in primary and secondary care. 2003. (www.nice.org.uk).

[5] Brawnwald E. Heart failure. In: Zipes, D, Libby, P, Bonow, R, Brawnwald, E, editors. Brawnwald's heart disease. A textbook on cardiovascular medicinePhiladelphia: W. B. Saunders; 2005. p. 457–662.

[6] Rodríguez-Artalejo F, Banegas Venegas JR, Guallar-Castillon P. Epidemiología de la insuficiencia cardiaca. Rev Esp Cardiol 2004;57:163–70.

[7] MacIntyre K, Capewell S, Stewart S, Chalmers JWT, Boyd J, Finlayson A, et al. Evidence of improving prognosis in heart failure. Trends in case fatality in 66547 patients hospitalized betwen 1986 and 1995. Circulation 2000;102:1126–31.

[8] Starfield B. Primary care systems in western industrialized nations. In: Starfield, B, editor. Primary care. Balancing health needs, services and technologyOxford: Oxford University Press; 1998. p. 344–5.

[9] Rakel RE, Williamson PS. Use of consultants. In: Rakel, RE, editor. Textbook of family practice. Philadelphia: W. B. Saunders; 1984. p. 190–7.

[10] Ross JE, Barr DM. Primary care, consultation, and referral. In: Taylor, RB, editor. Family medicine. Principles and practiceNew York: Springer Verlag; 1983. p. 465–9.

[11] Buitrago Ramírez F, Chávez García LM. Análisis de las interconsultas y pruebas complementarias solicitadas por un centro de salud en un período de tres años. Aten Prim 1990;7:200–4.

[12] Pérez de Castro I, Romo Espeso B, Liquete Pérez C, Díez García MA. Interconsultas y pruebas complementarias en un centro de salud. Aten Prim 1991;8:102–3.

[13] Rubin H, Gandek B, William HR, Kosinski M, McHorney CA, Ware JE. Patients ratings of outpatient visits in different practice settings. JAMA 1993;270:835–40.

[14] Quintana JM, Aróstegui I, García M, Arcelay A, Ortega M, Candelas S. Encuesta de satisfacción a pacientes de servicios de urgencias de hospitales de agudos. Rev Calid Asist 1998;13:220–7.

[15] Conesa A, Bayas JM, Asenjo MA, Baré ML, Manasanch P, Hedó R, et al. Calidad percibida por los usuarios de consultas externas de un hospital universitario. Rev Clin Esp 1993;192:346–51.

[16] Delbanco FL. Enriching the doctor–patient relationship by inciting the patient's perspective. Ann Intern Med 1992;116:414–8.

[17] Velasco Sánchez V, Otero Puyme A. Evaluación de la calidad de la información médica entre los niveles de atención primaria y especializada. Aten Prim 1993;11:406–11.

[18] Mimbela Sánchez MM, Foradada Baldellou S. Análisis de la interrelación atención primaria-atención especializada en la derivación de pacientes. Aten Prim 1993;12:65–9.

[19] Irazábal Olabarrieta L, Gutiérrez Ruiz B. Funciona la comunicación entre los niveles primario y secundario. Atenc Prim 1996;17:376–81.

[20] Cummins RO, Smith RW, Inui TS. Communication failure in primary care: failure of consultants to provide follow-up information. JAMA 1980;243:1650–2.

[21] Glenn JK, Hofmeister RW, Neikirk H, Wright H. Continuity of care in the referral process: an analysis of family physicians expectations of consultants. J Fam Pract 1983;16:329–34.

[22] Alonso Pérez de Ágreda JP, Febrel Bordejé M, Huelin Domeco de Jarauta J. Factores asociados a la derivación inadecuada entre atención primaria y especializada: estudio cualitativo en médicos de atención primaria. Gac Sanit 2000;14:122–30.

[23] Llobera Cànaves J. La derivación de pacientes de la atención primaria a la especializada. Gac Sanit 1988;9:271–5.

[24] Fraile de Abajo L, Abreu Galán MA, Muñoz García LC, Álvarez Montero S, Álamo Antúnez A, Frieyro Seguí JE. El médico de familia y el hospital. Análisis del proceso de interconsulta desde una unidad docente de medicina familiar y comunitaria. Med Clin (Barc) 1986;86:405–9.

[25] Goodman BW, Guy L. Clinical consultation from a University Family Medicine Teaching Unit. Fam Med 1983;12:123–8.

[26] Grupo para la Atención Médica Integrada y Contínua de Cádiz (GAMIC). La consultoría de Medicina Interna en Atención Primaria mejora la eficacia de la atención médica. Med Clin (Barc) 2004;122:46–52.

[27] Grupo para la Atención Médica Integrada y Contínua de Cádiz (GAMIC). Evaluación de la eficacia diagnóstica de la consultoría entre internistas y médicos de familia para los pacientes con dispepsia. Med Clin (Barc) 2004;123:374–80.

[28] SAS Institute Inc. Procedures guide, version 6.0. Cary, NC: SAS Institute; 1994.

[29] Grupo de trabajo de insuficiencia cardiaca de la Sociedad Española de Medicina Interna (SEMI). La insuficiencia cardiaca en los servicios de medicina interna (estudio SEMI-IC). Med Clin (Barc) 2002;118:605–10.

[30] Martínez-Sellés M, García Robles JA, Prieto L, Frades E, Muñoz R, Díaz Castro O, et al. Características de los pacientes ingresados por insuficiencia cardiaca según el estado de su función ventricular. Rev Esp Cardiol 2002;55:579–86.

[31] Varela-Roman A, Grigorian L, Barge E, Bastante P, de la Peña MG, Gonzalez-Juanatey JR. Heart failure in patients with preserved and deteriorated left ventricular ejection fraction. Heart 2005;91:489–94.

[32] McMurray JJ, SteWART S. Heart failure. Epidemiology, aetiology, and prognosis of heart failure. Heart 2000;83:596–602.

[33] Ho KK, Pinsky JL, Kannel WB, Levevy DJ. The epidemiology of heart failure: the Framingham Study. J Am Coll Cardiol 1993;22(Suppl A):6–13.
[34] Felker GM, Thompson RE, Hare JM, Hruban RH, Clemetson DE, Howard DL, et al. Underlying causes and long-term survival in patients with initially unexplained cardiomyopathy. N Engl J Med 2000;342:1077–84.
[35] Gheorghiade M, Bonow RO. Chronic heart failure in the United States: a manifestation of coronary artery disease. Circulation 1998;97:282–9.
[36] McKee PA, Castelli WP, McNamara PM, Kannel WB. The natural history of congestive heart failure: the Framingham study. N Engl J Med 1971;285:1441–6.
[37] Sosa Liprandi MI, González MA, Liprandi AS. Perspectiva de la IC en Argentina. Medicina (Buenos Aires) 1999;59:787–92.
[38] Garg R, Yusuf S, for the collaborative group on ACE inhibitor trial. Overview of randomized trials of angiotensin-converting enzyme inhibitors on mortality and morbidity in patients with heart failure. JAMA 1995;273:1450–6.
[39] Flather MD, Shibata MC, Coats AJS, et al. Randomised trial to determine the effect of nevibolol on mortality and cardiovascular hospital admission in elderly patients with heart failure (SENIORS). Eur Heart J 2005;26: 215–25.
[40] Exner DV, Dries DL, Waclawiw MA, Shelton B, domansky MJ. Beta-adrenergic blocking agents use and mortality in patients with asymptomatic and symptomatic left ventricular systolic dysfunction: a post hoc analysis of the studies of left ventricular dysfunction. J Am Coll Cardiol 1999;33:916–23.
[41] Lechat P, packer M, Chalon S, et al. Beta-blokers in heart failure: meta-analysis of randomized trials. Circulation 1998;98:1184–97.
[42] Pitt B, Zannad F, Cody R, Castaigne A, Pérez A, Palensky J, Wittes J. The effect of spironolactone on morbidity and mortality in patients with severe heart failure. N Engl J Med 1999;341:709–17.
[43] Pitt B, Remme W, Zannand F, et al. Eplerenone, a selective aldosterone blocker, in patients with left ventricular dysfunction after myocardial infarction. N Engl J Med 2003;348:1309-2.
[44] McMurray JJ, Ostergren J, Swedberg K, et al. Effects of candesartan in patients with chronic heart failure and reduced left-ventricular systolic function taking angiotensin-converting-enzyme inhibitors: The CHARM-Added trial. Lancet 2003;362:767–71.
[45] The Digitalis Investigation Group. The effect of digoxin on mortality and morbidity in patients with Heart Failure. N Engl J Med 1997;336:525–33.
[46] Thackray S, Witte K, Clarck AL, et al. Clinical trials update: OPTIME-CHF, PRAISE-2, ALL-HAT. Eur J Heart Fail 2000;2:209–12.
[47] Cleland JG, Ghosh J, Freemantle N, et al. Clinical trials update and cumulative meta-analysis from the American College of cardiology: WATCH, SCD-HeFT, DINAMIT, CASINO, INSPIRE, STRATUS-US, RIO-Lipids and cardiac resynchronization therapy in heart failure. Eur J Heart Fail 2004;6:501–8.
[48] Yusuff S, Peffer MA, Swedberg K, Granger CB, Held P, McMurray JJV, et al, for the CHARM Investigators and Committees. Effects of candesartan in patients with chronic heart failure and preserved left-ventricular ejection fraction: the CHARM-Preserved Trial. Lancet 2003;362:777–81.
[49] Senni M, Tribouilloy CM, Rodeheffer RJ, Jacobsen SJ, Evans JM, Bailey Kr, et al. Congestive heart failure in the community: trends in incidence and survival in 10-year period. Arch Intern Med 1999;159:29–34.
[50] Stewart S, MacIntyre K, Hole DJ, Capenell S, McMurray JJ. More "malignant" than cancer? Five-year survival following a first admission for heart failure. Eur J Heart Fail 2001;3:315–22.
[51] Thompson O'Brien MA, Oxman AD, Davis DA, Haynes RB, Freemantle N, Harvey EL. Educational outreach visits: effects on professional practice and health care outcomes (Cochrane Review). The Cochrane Library, Issue 4. Oxford: Update Software; 2002.
[52] Geyman JP, Brown TC, Rivers K. Referrals in family practice: a comparative study by geographic region and practice setting. J Fam Pract 1976;3:163–7.
[53] Morgan S, Folse R, D'Elia G. Referral patterns of family physicians and surgeons in a non-metropolitan area of Illinois. J Fam Pract 1979;8: 587–93.
[54] Moscovice I, Shortell SM, Schwartz CW. Referral patterns of family physicians in an underserved rural area. J Fam Pract 1979;9:677–82.
[55] Fry J. Twenty-one years of general practice-changing pattern. JR Coll Gen Pract 1972;22:521–8.
[56] Elliott C, Baskstrom D. Referral patterns in general practice. Aust Fam Physician 1972;1:155–6.
[57] Brock C. Consultation and referral patterns of family physicians. J Fam Pract 1977;4:1129–31.