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Living with Family and Clinical, Demographic, and Laboratory Characteristics in Patients with Heart Failure

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ABSTRACT

Objective: Heart failure (HF) is a progressive clinical syndrome associated with significant morbidity and mortality. It is known that during the course of this syndrome, social factors can impact clinical outcomes alongside medical interventions. Studies have demonstrated that social support provides favorable developments in mortality rates, event-free survival, and readmission rates in HF patients. In our study, we aimed to elucidate the effects of the concept of family, the most significant social support, on clinical characteristics, exercise capacity, echocardiographic, and laboratory features in HF cases.
Methods: A multicenter cohort study was conducted, including 303 patients previously diagnosed with HF, following current guidelines and presenting for outpatient follow-up. Patients with a new diagnosis of HF, those with acute decompensated HF, and those with a history of malignancy were excluded from the study. Demographic data (age, gender), comorbidities (hypertension, diabetes mellitus, atrial fibrillation, etc.), HF treatments, laboratory tests, and detailed transthoracic echocardiography results were recorded.
Results: Patients were divided into two groups based on whether they lived with a spouse, parent, child, or without any of them, defining the presence or absence of family support. In the study, 303 patients with an average age of 62.1±13.0, of which 94 (31%) were female, were included. The mean left ventricular ejection fraction was 28.7±8.1. When the groups were compared in terms of comorbidities, there was no statistically significant difference in the presence of hypertension, diabetes mellitus, hyperlipidemia, chronic obstructive pulmonary disease, stroke, or atrial fibrillation (all p>0.005). Coronary artery disease was more frequently observed in the group with family support, while chronic kidney disease was more common in the group without family support (p=0.008 and p=0.012, respectively). Smoking prevalence was significantly higher in the group without family support, while alcohol use showed no significant difference (p=0.046 and p=0.602, respectively). Analyzing the results, it was observed that patients with family support were more regularly monitored for HF reasons (71% vs. 59%, p=0.054).
Conclusion: It has been observed that the social support provided by family members in individuals with HF can have positive effects on the clinical course of the disease and the patient's lifestyle.

Keywords: Heart failure, Family, Social support

Kalp Yetersizliği Hastalarında Aileyle Birlikte Yaşamanın Hastalığın Klinik, Demografik ve Laboratuvar Özellikleriyle İlişkisi

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ÖZET

Amaç: Kalp yetersizliği (KY) ciddi morbidite ve mortalite ile seyredebilen ilerleyici klinik bir sendromdur. KY seyri sırasında tıbbi müdahalelerin yanı sıra, sosyal faktörlerin de klinik sonuçları etkileyebileceği bilinmektedir. Sosyal desteğin KY hastalarında mortalite, olaysız sağ kalım ve yeniden yatış oranlarında tatmin edici gelişmeler sağladığı gösterilmiştir Biz de çalışmamızda en büyük sosyal destekleyici olan aile kavramının KY olgularında klinik özellikler, egzersiz kapasitesi, ekokardiyografik ve laboratuar özellikleri üzerine olan etkilerini ortaya koymayı amaçladık.
Yöntem: Çok merkezli, kesitsel olarak yapılan çalışmaya güncel kılavuzlara uygun olarak daha önce KY tanısı koyulan ve ayaktan takip amacıyla poliklinik başvurusu olan 303 hasta dahil edildi. Yeni tanı KY, akut dekompanse KY olan hastalar ile malignite öyküsü olanlar çalışmadan dışlandı. Hastaların demografik verileri (yaş, cinsiyet), komorbiditeler (hipertansiyon, diabetes mellitus, atriyal fibrilasyon vb.), kullandıkları KY tedavileri, laboratuvar testleri ve ayrıntılı transtorasik ekokardiyografi sonuçları dahil olmak üzere ayrıntılı klinik verileri kaydedildi. Hastalar eş, anne, baba veya çocuklarıyla aynı evde yaşıyorsa aile desteği olanlar, bunlardan herhangi biri yoksa aile desteği olmayanlar şeklinde 2 gruba ayrılarak karşılaştırıldı.
Bulgular: Çalışmaya 94'ü (%31) kadın ve yaş ortalaması 62,1±13,0 olan 303 KY tanılı hasta dahil edildi. Hastaların ortalama sol ventrikül ejeksiyon fraksiyonu 28,7±8,1 idi. Gruplar komorbiditeler açısından karşılaştırıldığında hipertansiyon, diyabetes mellitus, hiperlipidemi, kronik obstruktif akciğer hastalığı, inme, atrial fibrilasyon varlığı açısından istatistiksel anlamlı fark yoktu (hepsi için, p>0.005). Koroner arter hastalığı aile desteği olan grupta anlamlı şekilde daha sık görülmekteyken kronik böbrek hastalığı ise aile desteği olmayan grupta daha sık izlenmekteydi. (sırasıyla p=0,008 ve p=0,012). Sigara kullanımı aile desteği olmayan grupta anlamlı şekilde daha yüksek iken alkol kullanım oranları arasında fark izlenmedi (sırasıyla p=0,046 ve p=0,602). Yapılan analizler sonunda aile desteği olan gruptaki hastaların KY nedeniyle daha yüksek oranda düzenli takipte olduğu görüldü (%71 vs. %59, p=0,054).
Sonuç: KY sahip kişilerde aile bireyleri tarafından oluşturulan sosyal desteğin hastalığın klinik seyri ve hastanın yaşam alışkanlıkları üzerine olumlu etkileri olabileceği görülmüştür.

Anahtar Kelimeler: Kalp Yetersizliği, Aile, Sosyal Destek

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Introduction

Heart Failure (HF) is a significant clinical syndrome resulting from the heart's diminished efficiency and the inability of circulating blood to meet the body's needs due to pathological changes in the cardiovascular system [1]. It is a complex condition with diverse symptoms affecting around 60 million people globally, 2 million people in our country, posing a widespread health concern [2,3]. Established drug classes are available to mitigate mortality in HF; nevertheless, adherence to these medications and consistent follow-up are imperative [4].

Throughout the progression of HF, several factors influence patients' quality of life. Among these factors, the level of environmental support holds substantial importance. Social support plays a pivotal role in enhancing patients' coping mechanisms, supporting treatment adherence, and positively impacting overall clinical outcomes [5]. In this context, the family stands out as one of the most crucial sources of social support in an individual's life. Despite various sources of social support, having a spouse and continuous support is deemed one of the most effective for HF patients [6]. Research has demonstrated the positive effects of being married or living with a partner in reducing mortality rates, promoting event-free survival, and lowering readmission rates in HF patients [7,8]. Conversely, HF patients with inadequate or no social support have been associated with higher rates of readmission and mortality [9-11]. Reports indicate that marital status significantly influences outcomes in HF [12,13]. While studies on HF typically concentrate on spousal support, it is crucial to recognize the presence of other family members sharing the same household as additional sources of social support.

This study aims to comprehend the potential impacts of family support on clinical characteristics, exercise capacity, echocardiographic findings, and laboratory features in HF patients.

Material and Methods

A total of 303 patients, followed in the outpatient clinic between 2018-2020, were included in this multicenter observational cohort study investigating the impact of living with family on the course of HF. Ethics Committee Approval was received. The study complied with the Declaration of Helsinki and informed consent has been obtained from all participants.

In this study, when α=0.05, β=0.20, 1-β=0.80, it was decided to include 300 individuals in the study and the power of the test was found to be 0.83234.

Exclusion criteria for the study were patients with insufficient information about living with family, the presence of acute decompensated HF, and newly diagnosed HF.

Demographic information on patients, HF etiology, presence of comorbidities like hypertension (HT), diabetes mellitus (DM), coronary artery disease (CAD) chronic obstructive pulmonary disease (COPD), New York Heart Association (NYHA) functional class, drug usage informations, physical examination findings (height, weight, pulse, blood pressure), HF symptoms and signs, left ventricle ejection fraction (LVEF) and routine biochemical parameters (hemogram, sodium, potassium, creatinine, N-terminal–pro-brain natriuretic peptide [NT-proBNP], glomerular filtration rate [GFR]) values were collected.

Electrocardiogram (ECG) findings and medication details were retrieved from the hospital registry system. Transthoracic echocardiography (TTE) was performed with an EPIQ 7 (Koninklijke Philips NV, Amsterdam, the Netherlands) echocardiography device and a 1.5–4.5 MHz ultrasound probe following the American Society of Echocardiography Standards [14]. LVEF was measured using the Simpson method.

Information regarding the patient's family life was collected through face-to-face interviews. Patients were considered to be living with family if they shared the same household with family members. Patients were divided into two groups, those living with their family and those not living with their family, and analyses were conducted accordingly.

Statistical Analysis

Data were recorded in a collection form, and statistical analyses were performed using IBM SPSS software version 23. Descriptive statistics were presented with frequency (%), mean±standard deviation, and median (min-max). Normal distribution conformity was assessed using histogram graphics and the Kolmogorov-Smirnov test. The Mann-Whitney U test evaluated non-normally distributed variables (HF etiology, HF type, gender, presence of DM, HT, CKD and COPD). The correlation between living with family and correlation was examined using the Spearman's bivariate correlation method. Correlation coefficients and p-values were determined. A p value <0.05 was considered statistically significant.

Results

Out of the 303 patients included in our study, 238 (78.5%) reported having support from family members residing in the same household. The mean age of the included patients was 62.1±13.0 years. The average age of patients with family support was found to be lower compared to those without support (61.5±13.2 vs 64.5±11.9, p=0.512).

Among the enrolled patients, 94 (31%) were female, with a higher proportion of females observed in the group without family support (29% vs. 40%, p=0.078). The presence of CAD was more prevalent in the group with family support (61% vs. 43%). Demographic characteristics based on the presence of family support are detailed in Table 1.

Evaluation based on NYHA functional classes revealed that advanced stages (NYHA III-IV) were present in 39% (25 cases) of the group without family support, while this number was 26% (61 cases) in the group with family support. There were no statistically significant differences between the groups regarding the use of guideline-recommended beta-blockers (BB), SGLT-2 inhibitors, and mineralocorticoid receptor antagonists (MRA) (Table 2).

Table 1. Baseline demographic characteristics according to the presence or absence of family support in heart failure patients

	Total (n=303)	Family support presence (n=238)	Family support absence (n=65)	p Value
Age, years	62.1±13.0	61.5±13.2	64.5±11.9	0.512
Female, n (%)	94 (%31)	68 (%29)	26 (%40)	0.078
Body mass index, kg/m2	27.3±5.7	27.4±5.6	27.2±6.2	0.812
Hypertension, n (%)	162 (%54)	126 (%53)	36 (%55)	0.726
Diabetes mellitus, n (%)	122 (%40)	97 (%41)	25 (%39)	0.848
Atrial fibrillation, n (%)	54 (%18)	42 (%18)	12 (%19)	1.000
Coronary artery disease, n (%)	174 (%57)	146 (%61)	28 (%43)	0.008
COPD, n (%)	55 (%18)	46 (%19)	9 (%14)	0.404
Dyslipidemia, n (%)	134 (%44)	102 (%43)	32 (%49)	0.359
Ischaemic stroke, n (%)	33 (%11)	29 (%12)	2 (%6)	0.247
Chronic kidney disease, n (%)	43 (%14)	27 (%11)	16 (%25)	0.012
Smoking, n (%)	61 (%20)	42 (%18)	19 (%29)	0.046
Alcohol, n (%)	20 (%7)	15 (%7)	5 (%9)	0.602
Heart rate, bpm	79.3±17.5	78.4±17.3	82.8±17.6	0.073
Systolic blood pressure, mmHg	112.4±18.6	112.3±18.2	112.9±20.5	0.818
Diastolic blood pressure, mmHg	64.4±10.8	64.3±10.4	64.9±12.3	0.668
NYHA 3-4, n (%)	86 (%28)	61 (%26)	25 (%39)	0.060
Dietary complience, n (%)	200 (%66)	161 (%68)	39 (%60)	0.249
Regular follow-up, n (%)	207 (%68)	169 (%71)	38 (%59)	0.054

COPD: chronic obstructive pulmonary disease, NYHA: New York Heart Association functional capacity

Table 2. Laboratory and clinical characteristics according to the presence or absence of family support in heart failure patients

	Total (n=303)	Family support presence (n=238)	Family support absence (n=65)	p Value
Hemoglobin, g/dL	13.2±1.9	13.2±1.9	13.0±2.0	0.604
NT-proBNP, pg/mL	4126(2840-9179)	3447 (2840-4053)	6643 (4107-9179)	0.017
Sodium, mmol/L	138.6±3.8	138.7±3.9	138.1±3.4	0.296
Potassium, mmol/L	4.6±0.5	4.6±0.5	4.5±0.5	0.550
Albumin, g/dL	4.4±0.5	4.4±0.5	4.4±0.6	0.857
Creatinine, mg/dL	1.2±0.7	1.2±0.7	1.3±0.5	0.154
GFR, CKD-EPI	67.1±23.8	69.8±23.8	57.1±20.8	<0.001
LDL, mg/dl	105.8±45.8	106.3±45.7	103.8±46.5	0.695
LV ejection fraction, %	28.7±8.1	28.2±8.0	30.2±8.4	0.077
ACEi or ARB, n (%)	247 (%82)	202 (%85)	45 (%70)	0,007
ARNI, n (%)	16 (%5)	14 (%6)	2 (%3)	0.342
Beta blocker, n (%)	274 (%90)	218 (%92)	56 (%86)	0.278
MRA, n (%)	215 (%71)	169 (%71)	46 (%71)	1.000
Loop Diuretic, n (%)	194 (%64)	147 (%62)	47 (%72)	0.116
Thiazide, n (%)	76 (%25)	60 (%25)	16 (%25)	1.000
Digoxin, n (%)	30 (%10)	24 (%10)	6 (%9)	1.000
Ivabradine, n (%)	28 (%9)	23 (%10)	5 (%8)	0.807
SGLT-2 inh, n (%)	56 (%19)	47 (%20)	9 (%14)	0.365
Influenza vaccination, n (%)	42 (%14)	36 (%15)	6 (%9)	0.309
ICD, n (%)	33 (%11)	28 (%12)	5 (%8)	0.478

ACEi: anjiotensin converting enzim inhibitors, ARB: anjiyotensin reseptör blockers, ARNI: angiotensin receptor/neprilysin inhibitör, CRT: cardiac resynchronization therapy, ICD: implantable cardioverter defibrillator, LV: left ventricle, MRA: mineralocorticoid reseptör antagonist, NT-proBNP: N-terminal pro-brain natriuretic peptide, SGLT-2 inh: sodium-gucose transport protein 2 inhibitors

Table 3. Correlation between family support presence and demographic and clinical characteristics in patients with heart failure

Parameters	r Value	p Value
Sex, Female	0.101	0.780
Coronary artery disease	-0.152	0.008
Hypertension	0.103	0.073
Diabetes mellitus	0.019	0.739
Chronic kidney disease	-0.156	0.006
Ischemic stroke	0.079	0.168
Chronic obstructive pulmonary disease	0.058	0.311
Smoking	-0.199	0.039
Alcohol use	-0.033	0.595
Dietary complience	0.066	0.250
NYHA III-IV	-0.117	0.042
Influenza vaccination	0.070	0.224
Atrial fibrillation	-0.009	0.880
Implantable cardioverter defibrillator	0.054	0.352
Regular follow-up	0.111	0.045

NYHA: New York Heart Association

However, renin-angiotensin system inhibitor (RAS-i) usage was higher in the group with family support (85% vs. 70%, p=0.007).

When examining baseline laboratory characteristics, parameters other than NT-proBNP and GFR were similar in both groups (Table 2). In the group with family support, NT-proBNP values were lower, and GFR values were higher (Table 2).

Comparison between patient groups with and without family support revealed some differences in baseline characteristics (Table 1). Correlation analyses between the presence of family support and various parameters indicated a significant negative correlation with CAD, CKD, smoking, and the presence of advanced functional capacity. Conversely, a significant positive correlation was found between the presence of family support and regular follow-up for HF management (Table 3).

Discussion

This study explores the interaction between familial support and various dimensions of HF patients, including clinical characteristics, exercise capacity, echocardiographic findings, and laboratory features. The high prevalence of familial support reported in 78.5% of HF patients underscores the crucial role familial dynamics play in the lives of individuals grappling with this chronic condition. However, this rate may be influenced by cultural and geographical differences. The findings align with existing study data investigating familial support among individuals with chronic illnesses in our country [15]. The patients included in our study are relatively younger, considering the average age of HF in our country. The tendency for the group with familial support to be younger suggests that family cohesion might be more easily maintained at early ages. As individuals age, family support may diminish due to various factors. Additionally, our study reveals that females experience less familial support, consistent with studies indicating that women benefit less from social support in societies. The gender-specific aspects of familial care in individuals with chronic illnesses may vary between communities and cultures. According to our study, men with HF seem to have more familial support than women. A more detailed examination of the gender-familial support relationship may help understand the challenges faced by female HF patients lacking robust familial networks.

No clear relationship is observed between comorbidities and familial support in HF patients. However, CAD tends to be more prevalent in individuals with familial support. This might imply a higher post-CAD survival rate in those with familial support, but further studies are needed to establish causality.

The NYHA functional classification plays a significant role in both the diagnostic process and treatment management of HF patients [16]. The higher prevalence of advanced stages (NYHA III-IV) in the group without familial support may indicate the potential impact of social dynamics on disease progression. Individuals without family support seem to have more uncontrolled and risky conditions regarding HF. This aligns with studies focusing on HF based on marital status.

Our study's HF patients adhere to medical treatments under expert guidance. Usage rates, especially when compared to European-based registry studies, are higher in our study [17,18]. However, there is no statistical significance in the usage of medications recommended by guidelines between the two groups. This suggests that, despite receiving similar optimal treatments, the group without familial support may experience worse functional capacity due to social factors. It is crucial to recognize that HF treatment cannot solely rely on medications, and the presence of social support may play a crucial role in achieving therapeutic goals.

Similarly, NT-proBNP values, indicative of HF severity, are essential markers in HF patients [19]. In the group without familial support, elevated levels of natriuretic peptides despite optimal treatment suggest inadequate control of disease severity.

The interaction between the kidneys and the heart is vital, particularly in HF patients [20]. Although the average GFR values in our study align with previous large-scale HF studies, significantly lower GFR values in the group without familial support may imply a higher prognostic risk in these patients [21]. However, more comprehensive studies are required to understand the mechanisms behind these findings and their clinical implications.

Smoking is an independent risk factor for cardiovascular disease and mortality [22]. Our study reveals higher smoking rates in individuals with HF lacking familial support. This may be associated with both insufficient social support and worse clinical conditions in terms of HF.

While no significant difference is detected in dietary compliance based on familial support in HF patients, a positive correlation is found between regular follow-up and familial support. This suggests that the concept of family may motivate individuals to monitor their illnesses more diligently.

Despite numerous studies assessing the impact of self-care, marital status, and the social environment on HF patients, our study stands out by specifically evaluating the presence of family members sharing the same household [9,10,23]. It highlights the role of social supporters living with HF patients, such as spouses, children, or parents. Existing studies present conflicting results regarding the impact of being married on HF outcomes, with some reporting no effect, while others suggest worse outcomes, especially in individuals who have been married and divorced [24,25]. Our study contributes to this body of knowledge by emphasizing that not only major outcomes like death, but also functional capacity and quality of life are crucial treatment goals for HF patients.

Our study has some limitations. Firstly, the relatively small number of patients and the single-center collection of data limit the generalizability of the findings. Additionally, variations among researchers in obtaining data pose another limitation. As the LVEF of the patients in our study is ≤40%, there is insufficient data for HF patient groups with mildly reduced and preserved EF. Moreover, familial support in our study is defined as the presence of family members sharing the same household, and the specific impact of family members on providing social support is not thoroughly evaluated. Due to these limitations, larger, prospective, multicenter studies are needed in the future.

Conclusion

In conclusion, this study provides valuable data on the complex relationship between familial support and various aspects of HF. The findings highlight the positive impact of the presence of familial support on the management and clinical outcomes of HF patients. As a result of this study, there arises a need for future research to evaluate the relationships between familial support and HF outcomes over a longer term.

Declaration Of Interests

The authors declare no conflicting interests.

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