Adherence of heart failure patients to heart failure medications and its determinants in the Aseer region, Southern Saudi Arabia

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ABSTRACT

Background: Heart failure is a complex clinical syndrome of cardiovascular disease. Heart failure occurs when the heart muscle is weakened and cannot pump enough blood to meet the body's needs for blood and oxygen. It is characterised by several attacks of dyspnoea, chest pain, orthopnea and pulmonary or systemic congestion. The heart inability to fulfill the demands of the body further failure of heart to pump the blood with normal efficiency. Lack of patients' adherence to their treatment may affect their clinical compensation. **Aim:** To assess the extent of assessing the level and predictors of medication adherence among patients with heart failure in the Aseer region. **Methodology:** A descriptive cross-sectional approach was used for targeting all registered heart failure patients attending the cardio clinic and chronic diseases clinic in Aseer region hospitals. Data were collected using a direct interview questionnaire that was developed by the researchers with the help of experts. Questionnaire included the patients' sociodemographic data, co-morbidities, disease-related data and drugs. **Results:** The study included 151 patients diagnosed with heart failure. About 66% of the patients were above the age of 60 years and 62.3% were males. Exact of 47% of the cases had the disease for less than 3 years and 43.7% of the patients had the treatment for more than 3 years. About 49% of the patients forget to have their medication at least once while 34.4% had problems remembering to take your medication. Totally, more than half of the patients had poor medication adherence and only 7.3% had a high adherence rate. **Conclusions and Recommendations:** In conclusion, the adherence rate for the patients' medication was poor due to forgetting to have the medications. Poor adherence was related more with single patients who are not working with poor income.

Keywords: Adherence, cardiac patients, compliance, heart failure, medications, predictors, Saudi Arabia

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Background

Heart failure (HF), also known as congestive heart failure (CHF), is when the heart is unable to pump sufficiently to maintain blood flow to meet the body's needs.[1,2] HF is characterised by several

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attacks of dyspnoea, chest pain, orthopnea and pulmonary or systemic congestion.[3] When this occurs, the heart is unable to provide adequate blood flow to other organs such as the brain, liver and kidneys.[4,5] HF may be due to failure of the right or left or both ventricles. HF can effect the life and quality of the life of patients.[6]

The goals of treatment for people with chronic HF are the prolongation of life, the prevention of acute decompensation and the reduction of symptoms, allowing for greater activity.[7] Behavioural, medical and device treatment strategies exist, which can provide a significant improvement in outcomes, including the relief of symptoms, exercise tolerance and a decrease in the likelihood of hospitalisation or death.[8] Patients non-adherence to their medications continue to challenge their efficacy, leading to poor outcomes with higher costs for patients and the healthcare system as a whole.[9,10] Both terms and compliance have been used interchangeably. The term adherence means either a specific research measure for the regularity with which patients take their medicines, typically expressed as a percentage of prescribed days and a more general definition perhaps best described by a World Health Organisation (WHO) report, 'the extent to which a person's behaviour—taking medication, following a diet, and/or executing lifestyle changes—corresponds with agreed recommendations from a health care provider'.[11]

It was observed that the chronic disease patients and the HF in the Abha primary health care centres are non-adherent to their medications. One of the important factors that may affect the treatment is continuity of care. This study is aiming to assess to adherence level among to HF patients in the Aseer region. However, their beginning begins with the atherosclerotic cycle several years ago owing to the cardiovascular risk factors, with specific weights in the global risk.[12-14]

The current study aimed to assess the level and predictors of medication adherence among patients with HF in the Aseer region.

Methodology

A descriptive cross-sectional approach was used targeting all registered HF patients attending a cardio clinic and chronic diseases clinic in Aseer region hospitals including Aseer Central Hospital (ACH), Armed Forces Hospital Southern Region (AFHSR), Khamis Mushayet General Hospital (KMGH) and Ahad Rofidah General Hospital (ARGH). Data were collected using a direct interview questionnaire that was developed by the researchers with the help of experts. Questionnaire included the patients' sociodemographic data, co-morbidities, disease-related data and drugs. Morisky medication adherence scale (MMAS-4) consisting of four questions designed to describe the medication-taking behaviour of patients. It has dichotomous response categories with yes or no.[12] The tool Cronbach's alpha for reliability is 0.61, which is questionable. The tool score range from 0–4. Score zero means high adherence, score of 1–2 means medium adherence and score of 3–4 means low adherence.

Ethical approval was obtained from Research Ethical committee (REC), King Khalid University (KKU).

Data analysis

After data were collected, it was revised, coded and fed to statistical software IBM SPSS version 22. The given graphs were constructed using Microsoft Excel software. All statistical analyses were done using two-tailed tests and an alpha error of 0.05. *P* value of less than or equal to 0.05 was considered to be statistically significant. Frequency and percent were used to describe the frequency distribution of each category for patients' data, disease-related data, medications and their adherence level. Chi-square test was used to assess the association between all related patients factors and their adherence level. Multiple stepwise logistic regression analysis was used to identify the most significant predictors for patients' medication adherence.

Results

The study included 151 patients diagnosed with HF. About 66% of the patients were aged above 60 years and 62.3% were males. Exact of 56.3% of the patients were married and 37.3% were illiterate while 10.6% were highly educated. Considering employment, 43.7% of the patients were not working and 41.7% were retired. Monthly income was less than 8000 SR among 68.9% of the patients and 52.3% were from rural areas with the

Table 1: Personal data of patients with heart failure in Aseer region, Saudi Arabia			
Personal data		No	Percentage
Age in years	18-59	51	33.8%
	60+	100	66.2%
Gender	Male	94	62.3%
	Female	57	37.7%
Marital status	Single	25	16.6%
	Married	85	56.3%
	Widowed	41	27.2%
Education	Illiterate	57	37.7%
	R & R	50	33.1%
	High School	28	18.5%
	Higher education	16	10.6%
Employment	Not working	66	43.7%
	Government	14	9.3%
	Private	8	5.3%
	Retired	63	41.7%
Monthly income	<8000 SR	104	68.9%
	8000-15000 SR	40	26.5%
	>15000 SR	7	4.6%
Residence	Urban	72	47.7%
	Rural	79	52.3%
Distance from the hospital	<30 min	80	53.0%
	≥30 min	71	47.0%
Smoking	Active smoker	21	13.9%
	Passive smoker	8	5.3%
	Ex-smoker	20	13.2%
	Non smoker	102	67.5%

distance between residence and hospital exceeding 30 minutes among 47% of the cases. As for smoking, 67.5% of the patients were non-smokers and 13.9% were active smokers [Table 1].

Table 2 demonstrates HF related data. Exact of 47% of the cases had the disease for less than 3 years and 43.7% of the patients had the treatment for more than 3 years. About 48% of the patients had four drugs daily and 32.5% had four co-morbidities. Receiving pharmaceutical health education was reported by 63.6% of the patients and receiving HF control health education was among 53.6% of the patients.

Considering medication adherence [Table 3], it was clear that 49% of the patients forget to have their medication at least once while 34.4% had problems remembering to take your medication. Also, 37.1% of the patients stopped medications when felt better and 27.2% stopped when felt worse. Totally, 53.6% of the patients had poor medication adherence and only 7.3% had a high adherence rate.

Table 4 illustrates the relation between patients' data and their

adherence to medications. About 58% of the widowed patients were adherent to treatment in comparison to 24% of the single patients with recorded statistical significance ($P = 0.024$). High adherence was also recorded among 54.5% of the patients with no work compared to 14.3% of those who worked at governmental jobs ($P = 0.033$). Exact of 51.9% of patients with low income (<8000 SR monthly) had high adherence to medications compared to none of those with higher income ($P = .018$). A high adherence rate was recorded for patients who had the treatment recently (<1 year) compared to 34.8% of those who had the treatment for more than 3 years ($P = .001$). Patients who received pharmaceutical health education had lower adherence to medications than those who did not (36.5% vs. 63.6%, respectively). Also, high adherence was recorded among 34.6% of those who received HF control health education compared to 60% of those who didn't ($P = .002$). About 33% of the patients who had diet control had a high adherence rate compared to 53.6% of those who didn't ($P = .017$).

Multiple logistic regression model was performed including all factors. The factors included in Table 5 were found to be the most significant. Marital patients had 42% more likelihood for high adherence than others (OR = 1.42) and high income was associated with 53% less likelihood for high adherence (OR = 0.47). High education associated with 18% less likelihood for high adherence (OR = 0.82) while the urban residence was associated with tripled likelihood for adherence to the patients' medications (OR = 3.1). More treatment duration (>3 years) was associated with 62% less likelihood for adherence to medications (OR = 0.38). Receiving pharmaceutical health education was associated with a 56% less likelihood for high medication adherence among the study patients (OR = 0.46).

Discussion

Cardiovascular diseases (CVDs) including HF are now reported as the main cause of death and disability worldwide.[15] The WHO reported that in the year 2008, out of 17.3 million CVD deaths globally, heart attacks (myocardial infarction) and strokes were responsible for 7.3 and 6.2 million deaths, respectively.[16,17] According to the latest WHO data published in 2017 Coronary Heart Disease Deaths in Saudi Arabia reached 23,624 or 24.25% of total deaths. The age-adjusted death rate is 174.22 per 100,000 of the population ranks Saudi Arabia number 34 in the world.[18] Many clinical trials were conducted to establish evidence-based medications that are effective in the treatment of CVD. These drugs will be ineffective if patients have poor adherence to their prescribed medications. Poor adherence to therapies has been linked to a variety of problems, including poor blood pressure control, re-hospitalisation and increased healthcare resource utilisation.[19]

The current study aimed to assess the medication adherence rate among patients with HF in the Aseer region. The study revealed that more than half of the patients recorded poor adherence to the prescribed medications. The main factor behind poor

Table 2: Heart failure data among patients in the Aseer region, Saudi Arabia

Heart failure data		No	Percentage
Duration of HF	<3 years	71	47.0%
	3-10 years	58	38.4%
	>10 years	22	14.6%
Duration of treatment	<1 year	42	27.8%
	1-3 years	43	28.5%
	>3 years	66	43.7%
Number of drugs \ Day	One	8	5.3%
	Two	38	25.2%
	Three	32	21.2%
	Four	73	48.3%
Number of co-morbidities	One	23	15.2%
	Two	39	25.8%
	Three	40	26.5%
	Four	49	32.5%
Receiving pharmaceutical health education	Yes	96	63.6%
	No	55	36.4%
Receiving HF control health education	Yes	81	53.6%
	No	70	46.4%

Table 3: Treatment adherence among patients with heart failure in Aseer region, Saudi Arabia

Adherence data	No	Percentage
Do you ever forget to take your medication?	74	49.0%
Do ever have problems remembering to take your medication?	52	34.4%
When you feel better, do you stop medication?	56	37.1%
Sometimes if you feel worse, do you stop medication?	41	27.2%
Class of Adherence		
Low adherence	81	53.6%
Medium adherence	59	39.1%
High adherence	11	7.3%

Table 4: Distribution of heart failure patients' adherence to their treatment according to patients' characteristics

Patient bio-demographic data		Adherence level				P
		Low adherence		Medium/high		
		No	Percentage	No	Percentage	
Age in years	18-59	29	56.9%	22	43.1%	0.571
	60+	52	52.0%	48	48.0%	
Gender	Male	56	59.6%	38	40.4%	0.060
	Female	25	43.9%	32	56.1%	
Marital status	Single	19	76.0%	6	24.0%	0.024*
	Married	45	52.9%	40	47.1%	
	Widowed	17	41.5%	24	58.5%	
Education	Illiterate	32	56.1%	25	43.9%	0.061
	R & R	20	40.0%	30	60.0%	
	High School	17	60.7%	11	39.3%	
	Higher education	12	75.0%	4	25.0%	
Employment	Not working	30	45.5%	36	54.5%	0.033*
	Government	12	85.7%	2	14.3%	
	Private	3	37.5%	5	62.5%	
	Retired	36	57.1%	27	42.9%	
Monthly income	<8000 SR	50	48.1%	54	51.9%	0.018*
	8000-15000 SR	24	60.0%	16	40.0%	
	>15000 SR	7	100.0%	0	0.0%	
Residence	Urban	35	48.6%	37	51.4%	0.237
	Rural	46	58.2%	33	41.8%	
Smoking	Non smoker	58	56.9%	44	43.1%	0.459
	Active smoker	9	42.9%	12	57.1%	
	Passive/Ex-smoker	14	50.0%	14	50.0%	
Distance from the Hospital	<30 min	44	55.0%	36	45.0%	0.723
	≥30 min	37	52.1%	34	47.9%	
Duration of HF	<3 years	35	49.3%	36	50.7%	0.426
	3-10 years	35	60.3%	23	39.7%	
	>10 years	11	50.0%	11	50.0%	
Duration of treatment	<1 year	12	28.6%	30	71.4%	0.001*
	1-3 years	26	60.5%	17	39.5%	
	>3 years	43	65.2%	23	34.8%	
Drugs/day	1-2	24	52.2%	22	47.8%	0.811
	3-4	57	54.3%	48	45.7%	
Co-morbidities	1-2	28	45.2%	34	54.8%	0.081
	3-4	53	59.6%	36	40.4%	
Receiving pharmaceutical health education	Yes	61	63.5%	35	36.5%	0.001*
	No	20	36.4%	35	63.6%	
Receiving HF control health education	Yes	53	65.4%	28	34.6%	0.002*
	No	28	40.0%	42	60.0%	
Diet control	Yes	36	66.7%	18	33.3%	0.017*
	No	45	46.4%	52	53.6%	
Exercise control	Yes	28	59.6%	19	40.4%	0.326
	No	53	51.0%	51	49.0%	

P: Pearson X^2 test. *$P<0.05$ (significant)

adherence was forgetting of having the drugs. Patients who received health education regarding the nature of the disease and medications were also less adherent to the medications. This may be explained by that, those patients know about lifestyle and dietary modifications which made them more controlled even with negligence of drug intake. High education was inversely related to adherence as those with high education were mostly employed with many life burdens causing them not to remember their treatment regularly.

Main message

This may explain that the adherence rate was higher among patients who were not working as they are busy with no life matter keeping drug intake regularly. Also, patients who had the treatment for less than 1 year were more adherent to the treatment as.

Highlights

This study depicted that physicians should pay more time in

Table 5: Multiple stepwise logistic regression models for predictors of patients' adherence to treatment

Factors	*B*	*P*	OR	95% C.I for OR	
				Lower	Upper
Married	0.35	0.048	1.42	1.00	2.02
Income	-0.76	0.049	0.47	0.21	1.00
Education	-0.20	0.048	0.82	0.63	1.00
Urban residence	1.13	0.022	3.10	1.18	8.10
Distance >30 min	1.09	0.037	2.98	1.07	8.31
Treatment duration	-0.96	0.010	0.38	0.23	0.63
Pharmaceutical health education	0.78	0.052	0.46	0.21	1.00
Constant	0.16	0.915	1.18		

B: Regression co-efficient. OR: Odds ratio. CI: Confidence interval

health education for the patients focusing on the importance of being controlled through lifestyle modifications and adherence to the prescribed treatments.

Conclusions

In conclusion, the adherence rate for the patients' medication was poor due to forgetting to have the medications. Poor adherence was related more with single patients who are not working with poor income. Adherence was better among newly diagnosed cases that had the treatment for a short duration. More attention should be paid to correctly detect the main causes behind this poor adherence to overcome and also to find alternative modern therapies if it is related to the drug or its side effects.

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Conflicts of interest

There are no conflicts of interest.

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