Pak Heart J

OPTIMAL MEDICAL THERAPY IN CHRONIC HEART FAILURE

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ABSTRACT

Objective: The aim of this study was to audit the use of optimal medical therapy (OMT) in patients with heart failure.

Methodology: This descriptive study was carried out in AFIC-NIHD from April 2011 to February 2012. Seventy consecutive stage D heart failure patients were included in the study. The patients were assessed clinically by a cardiologist and all previous documentation, referral letters, prescriptions, and purchase receipts were reviewed. To identify any other medication patients might have been taking (which did not appear on the prescriptions) patients were asked to identify common medicine packs. The patients underwent a detailed clinical evaluation including history, physical examination. Relevant investigations were done. AACF/ AHA and ESC Guidelines for the diagnosis and treatment of acute and chronic heart failure were taken as standard of care.

Results: In our audit we found that a large proportion of patients who were at high risk as per the Seattle Heart Failure Model (SHFM) were not on OMT, only 12.5% of the patients were on ß blocker that have been shown to improve mortality in the large randomised clinical trials. 64.1% were not taking any ß blockers where as 54.7% were not on ACE inhibitors and 53.1% were not receiving any aldosterone antagonist.

Conclusion: We concluded that a large proportion of patients were not on OMT despite not having any contraindication to such therapy. This deprives them of significant survival benefit.

Key Words: Heart Failure, Optimal Medical Therapy, Audit

INTRODUCTION

Systolic heart failure is a chronic condition with significant morbidity and mortality, resulting in overall increased cost to any health care system because of increased clinical consultations, hospital admissions, pharmacological and device treatment.[1] Evidence based optimal medical therapy (OMT) has been shown to reduce mortality. Penetration of OMT into clinical practice has not been ideal. The following international guidelines were taken as the standard of care for the management of heart failure:

1. AACF/ AHA guidelines for the diagnosis and management of heart failure in adults – 2009 focused update.[2]
2. ESC Guidelines for the diagnosis and treatment of acute and chronic heart failure.[3]

We sought to conduct an audit about the use of OMT in stage D heart failure patients referred to AFIC - NIHD for heart transplant assessment.

METHODOLOGY

This descriptive study was carried out in AFIC-NIHD from April 2011 to February 2012. We prospectively collected data on 70 consecutive stage D heart failure patients. These patients had been referred to AFIC - NIHD for the management of advanced heart failure and assessment for the need of heart transplantation. They were assessed clinically by a cardiologist and all previous documentation, referral letters, prescriptions, and purchase receipts were reviewed. To identify any other medication patients might have been taking (which did not appear on the prescriptions) patients were asked to identify common medicine packs. The patients underwent a detailed clinical evaluation including history and physical examination. The echocardiograms were repeated to document cardiac structure and function. The lab investigations performed included ECG, complete blood count, serum urea, Creatinine, Na, K, bilirubin, ALT, alkaline phosphatase and BNP levels at baseline and then again at 4 weeks.

The data was analyzed by using software SPSS version 10. The quantitative variables were presented as mean and standard deviation while qualitative variables as frequency and percentage.

RESULTS

In our audit we found that a large proportion of patients with stage D heart failure were not on OMT. The distribution of OMT in patients is shown in Tables 1-3, and a comprehensive discussion of the results is given below.

The results in Table 2 shows that only 12.5% of the patients were on ß-blocker that have been shown to improve mortality in the large randomized clinical trials (bisoprolol, carvedilol, nebivolol, Metoprolol controlled release/ Extended release). This indicates a poor penetration of ß-blocker into heart failure practice.23.4% of patients were not on mortality reducing ß-blocker. To look into the common causes for non-prescription of ß-blocker we looked through the clinical history for contraindications to ß-blocker therapy and found that none of these patients had asthma or symptomatic peripheral vascular disease. This may have simply been by chance, but the patients still needed ß-blocker therapy. We looked at the ECGs of all the patients and found no evidence of a high grade AV block. The mean PR interval in this population was 174 ms (min 99 ms, max 289 ms).

Table 1: Different Classes of Drugs Prescribed to Patients

Drug Class/ Name	Drug Prescribed %	Drug Not Prescribed %
Beta Blockers	35.9	64.1
ACE Inhibitors	45.3	54.7
ARBs	6.3	93.8

Table 2: Shows ß Blockers Prescribed

Drug Class / Name	Patients Prescribed the Drug %
Trial Proven Beta Blockers (Carvedilol, Bisoprolol, Metoprolol Controlled Release/ Extended Release*)	12.5
Beta Blockers not Trial Proven for Heart Failure	23.4
Total Patients on Beta Blockers	35.9

*None of the patients was taking Metoprolol Controlled release /Extended release.

We instituted beta blocker therapy in all these patients and on follow up we did not find any increase in heart block in these patients. No patients reported to us with symptomatic brady-arrhythmias.

Table 3: Use of Aldosterone Antagonists

Drug Class / Name	Patients %
Aldosterone Antagonists (Spironolactone)	17.3
Combination of Furosemide and Spironolactone	29.7
Total Patients Receiving Aldosterone Antagonists in Some Form	46.9
Patients not on Aldosterone Antagonists	53.1

Table 4: Renal Profiles of Patients at Baseline and at 4 Weeks

Renal profile at baseline					
Serum levels	**Min**	**Max**	**Mean**	**Median**	**Std. Deviation**
Potassium (mmol/L)	3.8	6.4	4.27	4.1	.44
Urea (mg/dL)	16	192	47.3	40	28.5
Creatinine (mg/dL)	0.6	2.8	1.1078	1	.42
Renal profile at 4 weeks					
Potassium (mmol/L)	3.8	5.0	4.26	4.2	0.26
Urea (mg/dL)	12	96	40	37	17
Creatinine (mg/dL)	0.6	2.2	0.99	0.96	0.27

The prescription rate of ACEI (45.3%) and AA (46.9%, this includes those on combination pills – e.g, spiromide) can at best be said to be modest. Only 6.3% of our patients were receiving ARBs. To look into the possibility of renal dysfunction limiting the use of these drugs we looked at the serum creatinine, potassium levels, and calculated Creatinine clearance by the Cockgroft-Gault formula Table 4. It was clear to us that a very small number of patients actually were to be excluded from the prescription based on the serum K or creatinine levels. We initiated the ACI and AA in all the patients after optimization of fluid balance and other heart failure therapy. The repeat values of the same variables at 4 weeks are shown in Table 4. The mean serum potassium rose from 4.1 to 4.2 mmol/L (student's t test applied; p=0.1). The serum creatinine levels had fallen from 1.1 to 0.9 mg/dLand were statistically significant (Wilcoxon signed rank test applied; p=0.002).This clearly shows that the introduction of OMT actually improved renal perfusion. It is very clear that these patients had sufficient reserve to tolerate the ACEI and AA yet did not receive these therapies.

Our study showed that 75% of patients were receiving digoxin (with the same renal profile).

A large number of patients were using trimetazidine, and an herbal medicine Tricardin, but were only on diuretics or digoxin as the alternative medications. Literature search did not reveal any significant randomised controlled trials for the use of Tricardin in heart failure.

DISCUSSION

Evidence based OMT in heart failure reduces morbidity and mortality. This has been emphasized in all international practice guidelines. ß-blockers, have been shown to improve symptoms reduce arrhythmic risk and mortality in multiple trials.[4-8] The ß-blockers which have shown mortality benefit in heart failure so far include carvediolol, bisoprolol, and metoprolol. Prescribing metoprolol tartrate for mortality reduction is not supported by evidence based guidelines; it's use was tested in the MDC study.[9] Although there a was a beneficial effect for the combined end point of morbidity and mortality, but this was primarily driven by the morbidity end point and there was no mortality benefit. ACE inhibitors have been shown to reduce mortality in major trials as well.[10-13] Similar benefits have been shown for Angiotensin receptor blockers, and aldosterone antagonists (AA).[14-16]

While Digoxin does improve symptoms and exercise tolerance, and its withdrawal from the prescription can lead to worsening of symptoms, it has not been shown to confer any mortality benefit.[17]

Despite concrete data to support the use of OMT in all stages of heart failure there is considerable variation in the prescription of these therapies in patients with heart failure. Heart failure audits in the last 2-3 years in the UK show that although the penetration of evidence based therapy for heart failure into clinical practice is on the rise, however it is not complete.[18,19] Multiple factors influence the prescription of ß-blockers including concerns regarding advanced age, low EF, bradycardia, low BP ; these may be the very people who stand to benefit from the OMT.[20] Similarly ACE inhibitors and AA are known to be under prescribed due to concerns regarding renal function and sometimes for no discernible reason.[21,22]

Our study found that a large proportion of patients had not been prescribed evidence based OMT for heart failure. We also showed the common beliefs and fears surrounding the prescription of ß-blockers, ACEI, ARB and AA can actually be alleviated by simple and careful clinical and lab monitoring of the patient, thus giving full benefit to the patient.

CONCLUSION

Evidence based OMT is not used in the patients who are likely to benefit from it the most. Given the proven mortality benefit by these medications their prescription needs to be increased.

ACTION PLAN

1. The benefits of OMT in heart failure need to be reiterated to the physicians and cardiologists.
2. Concerns for the safety of patients not supported by scientific data need to be addressed and allayed so that

the prescription of these lifesaving, easily available medications can increase.

3. Dedicated heart failure services need to be set up. This is likely to ensure adequate clinical and lab follow up of these patients along with measures to ensure compliance.

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