



Clinical Pharmacist Interventions in Managing Cardiovascular Risk Factors

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ABSTRACT

Cardiovascular disease is one of the major causes of death in renal failure patients. There are many modifiable and non-modifiable risk factors which accounts for cardiovascular diseases. Some of the risk factors like smoking, physical inactivity, inappropriate diet, hyperlipidaemia are considered as modifiable risk factors which can be controlled by an appropriate intervention given to patients by healthcare teams. The aim of the present study is to observe an improvement in risk factors associated with cardiovascular disease in renal failure patients with an appropriate pharmacist intervention. The change in the mean values of BP, total cholesterol, LDL, fasting blood glucose were observed in patients who were followed by clinical pharmacist for about 12 months with an appropriate education on smoking cessation, management of diet and physical activity. Thus a clinical pharmacist can serve as a vital member of the multidisciplinary team especially in countries like India where physicians can effort less on educating and further follow up of patients.

Keywords: smoking cessation, renal failure, cardiovascular complications, hypertension, hyperlipidaemia.

INTRODUCTION

Cardiovascular disease is one of the major causes of deaths. The percentage of deaths in India due to cardiovascular disorders was estimated to be 30-40%.¹⁻⁵ There are many risk factors which may lead to cause cardiovascular disorders in patients. These risk factors can be classified as modifiable and non-modifiable. Risk factors like smoking habit, physical inactivity, diet, lipid levels are considered as modifiable risk factors. Whereas certain risk factors like age, gender, family history of disorders are to be considered as non-modifiable risk factors⁶⁻⁷. According to the WHO ranking-2011 for Coronary Heart Disease (CHD), India ranks at 37 with a risk rate of 165.8, which is to be considered as too high when compared to UK, Canada, Australia, Italy and Japan (68.8, 66.2, 60.3, 51.7 and 31.2 respectively).

The cardiovascular deaths can be controlled by modifying the risk factors which may lead to cause the disorders. The patients can control these risk factors by seeking the support from healthcare professionals. Clinical pharmacist plays a unique role to assist patients in controlling the risk factors, providing an appropriate counselling aid, thereby improving patient's health. In hospitals pharmacist are ideally placed to provide appropriate information and counselling on dispensed medications moreover they also advice on measures how to prevent the risk factors for most of the diseases⁸⁻⁹. It is stated that the main risk factors for any cardiovascular disease are smoking, inappropriate diet, physical inactivity which in-turn leads to hypertension, diabetes. Hypertension and diabetes are the two important disorders which impacts on many organs in our body.

Many of the cardiovascular disorders present an opportunity for increased involvement of pharmacist in integrated patient care models can decrease cardiovascular risk factors¹⁰⁻¹². As primary care physicians are more effective in managing acute conditions they can effort less in managing chronic conditions or providing an appropriate counselling aids to their patients which in-turn gives an opportunity for other healthcare professionals like pharmacist¹³⁻¹⁴. This study emphasize on roles of clinical pharmacist to improve the patients' health by managing the risk factors like smoking cessation, dietary restriction, improving physical activity and educating the patients to empower them to care for themselves.

The present prospective study was carried out by conducting a survey for patients with more than 2 risk factors for the development of cardiovascular disease; the appropriate data was collected from two tertiary care hospitals which are located in Telangana state of India. Patients with more than 2 risk factors for cardiovascular disease were enrolled and the outcomes of pharmacist implemented clinical interventions in decreasing risk factors were evaluated. The expected outcomes of this study were an improvement in blood pressure, diabetes, lipid profile when patients were imposed to improve their physical activity, control diet and prevent smoking by appropriate pharmacist interventions¹⁵⁻¹⁸.

METHODS

Inclusion criteria

1. Patients with more than 2 risk factors for cardiovascular disease.



2. Patients who are smokers, less physical activity and with inappropriate diet control.

Ethical approval: an ethical approval was obtained from the hospital ethics committee.

The total number of patients enrolled initially in this study was 73. All the patients were males, smokers with more than 2 risk factors for cardiovascular disease, with less physical activity and dietary restriction. Out of 73 patients 14 patients were withdrawn from the study and only 59 patients were actively participated in pharmacist interventions till the end of the study. An initial baseline mean values of patients characteristics has been represented in table-1.

Table 1: Patients demographic data

| Patients characteristics | |
|-----------------------------------|-------------|
| Age (years) | 58.94±12.38 |
| Number of males | 136 |
| Average Framingham Risk score | 25% |
| Number of smokers | 38.42% |
| Average Fagerstorm test | 6.38 |
| Systolic blood pressure (mmHg) | 145 |
| Total cholesterol (mg/dl) | 56.84% |
| LDL level (mg/dl) | 56.84% |
| Fasting blood glucose (mg/dl) | 156 |
| Patients with physical inactivity | 54 |
| Patients on inappropriate diet | 53 |

*All values are in SD±mean value and average (%).

The fagerstorm test for nicotine dependence and Framingham risk score were calculated initially. The mean values of fagerstorm test and Framingham risk score were 6.38 and 25.15 respectively, which states that almost all patients had a high dependence for nicotine and they are highly prone for coronary artery disease within 10 years.

The mean values of initial fasting blood glucose, total cholesterol and LDL were found to be 156 mg/dl, 205mg/dl and 134mg/dl respectively. The mean age of patients was found to be 48years. Pharmacist interventions were made to prevent smoking, improve physical activity, control diet along with appropriate information and counselling on dispensed drugs. All the above mentioned interventions were made for about 1 year and outcome was evaluated.

Smoking cessation programme by pharmacist was done by certified smoking cessation service provider (CSCSP). Only 4 patients had used nicotine replacement therapy and others enrolled in behavioural therapy where well qualified and certified pharmacists educated the patients regarding smoking cessation. Obese patients and those with physical inactivity were counselled by pharmacist on weight loss, regular exercise, lifestyle and diet modifications.

All the patients were followed by pharmacist for about 12 months and their change in body weight, physical activity, diet, smoking status, blood pressure, total cholesterol, LDL levels, blood glucose levels were recorded. The outcome was concluded to be successful if there is an improvement in the above mentioned risk factors by pharmacist interventions¹⁹⁻²¹.

The data analysis was done by using Microsoft- EXCEL.

RESULTS

All the patients were communicated by clinical pharmacist at least every 2 weeks for a course of 12 months. The change in the mean values after pharmacist intervention has been represented in table-2. The average age of the patients enrolled in this study was 48 years. After a successful pharmacist intervention a decrease in Blood pressure, blood glucose level, total and LDL cholesterol were noted. The mean baseline systolic blood pressure for 59 patients was 145.37 which had reduced to 139.7mm Hg. Although the target range for non-diabetic and non-renal failure patients was achieved but the target range of 130/80 mmHg for diabetic patients was not achieved in 7 diabetic patients out of 36.

Of 59 patients, 36 patients were diabetic with a mean initial fasting blood glucose level of 156mg/dl, the target fasting blood glucose was 100mg/dl, which was achieved in about 27 patients with a mean post-interventional fasting glucose level of 135mg/dl in 36 patients.

Similarly there is an improvement in total cholesterol, LDL and fagerstorm test values. The mean pre-interventional values of total cholesterol, LDL were 205mg/dl, 134mg/dl respectively. The post-interventional improvement was noted and the mean total cholesterol and LDL were 176 and 102mg/dl respectively.

The mean fagerstorm test value which was initially 6.38 had reduced to 4.2 after intervention.

DISCUSSION

An overall improvement in the patient's risk factors by pharmacist intervention was noted in this study. An improvement was noted in the 3 modifiable risk factors (smoking, physical activity, diet) which showed a positive impact on other factors like blood pressure, cholesterol, glucose level.

Even though the target blood pressure had not been achieved in few diabetic patients but overall improvement in systolic blood pressure was achieved from 145.37 to 139.7mmHg with a mean difference of 5.6mmHg.

An initial Framingham risk score was calculated for all patients and the mean values of Framingham risk score was found to be 25% which indicates that there is a 25% chance for the patients to develop coronary artery disease within 10 years. A similar improvement was also noted in fasting blood glucose, total cholesterol and LDL levels. As the patients had a fagerstorm test value of 6.3



initially which indicates that they are highly dependent on nicotine (a value of 8-10 very high, 6-7 high and 4-5 medium and below 4, low dependence), a post-interventional value was noted to be 4.2. An evaluation form for hands-on participation to quit smoking was filled initially. A thorough and well-structured patient education provided by clinical pharmacist had led to such positive outcomes.

Limitations

This study was carried out on a small number of patients. The time duration was also small. Because of lack of financial support the participants were only provided with pamphlets, brochures and self-assessment sheets.

CONCLUSION

A well organised, team based approach to patients with a risk of cardiovascular disease is the goal in managing such disorders. As the population of patient's with increasing risk factors for cardiovascular disease continues to grow, clinical pharmacist can serve as a vital member of the multidisciplinary team especially in countries like India where physicians can effort less on educating and further followup of patients. It is important to note that there is a need of clinical pharmacist in hospitals to educate and improve the health of patients and we anticipate an increasing demand for this role in future.

Table 2: Mean value difference between pre and post intervention

| Patients characteristics | Initial mean values | Mean values after pharmacist intervention | Mean difference | P-value |
|-----------------------------------|---------------------|---|-----------------|---------|
| 1) Systolic blood pressure (mmHg) | 145 | 139.7 | 5.3 | 0.006 |
| 2) Average Fagerstorm test value | 6.38 | 4.2 | 2.18 | 0.059 |
| 3) Total cholesterol (mg/dl) | 205 | 176 | 29 | 0.008 |
| 4) LDL level (mg/dl) | 134 | 102 | 32 | 0.009 |
| 5) Fasting blood glucose (mg/dl) | 156 | 90-100 | 56-66 | 0.001 |

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