Prescribed Drugs for Secondary Prevention in Post-Myocardial Infarction Patients in Shiraz

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Abstract

Background- Coronary artery diseases are the leading cause of death in the developing countries, including Iran. Continued advances in medical and surgical techniques, combined with effective and focused programs in cardiac rehabilitation, are critical to reduce the overall incidence of coronary artery diseases. Now it is recommended that all survivors of acute myocardial infarction receive antiplatelet drugs, beta-adrenergic blocking agents, ACE inhibitors and statins. However, studies show that the ratio of prescribing these drugs is far lower than ideal. This study has been designed to evaluate these ratios in Iran.

Methods- In a descriptive, cross-sectional retrograde study, the ratio of prescribing the above-mentioned drugs in 912 randomly selected patients from Shiraz University hospitals who met WHO criteria for myocardial infarction from March 2000 to March 2001 were studied. Trained medical students recorded demographical data, location of infarction, risk factors and pharmacologic therapy at the time of the discharge of the patients from the medical recording files in a standardized questionnaire.

Results- The mean age of the studied patients was 61±12 years. The most frequently prescribed drugs were antiplatelet agents and the least frequent ones were statins. There were statistically significant relationships between cigarette smoking and beta-adrenergic blocking agents administration, hyperlipidemia and statins administration and hypertension and ACE inhibitors administration.

Conclusion- There is a need for improvement in secondary prevention in patients with myocardial infarction at the time of hospital discharge, and risk factor evaluation and suitable drug therapy is necessary for secondary prevention in Shiraz University hospitals ***(Iranian Heart Journal 2003; 4 (4):44-48).***

Key words: Post-MI ■ Drugs ■ Secondary prevention

Coronary artery disease (CAD) is still the number one killer in the developed countries [1,2] and developing countries including Iran.[3] The morbidity and subsequent disabilities incurred from coronary artery disease alone have far-reaching medical and socioeconomic implications.[4] Continued major efforts in prevention are critical to reducing the overall incidence of CAD. It is of primary importance for the clinical cardiologist to keep in mind the parameters allowing an adequate prognostic stratification in post-infarct patients in order to make the best diagnostic and therapeutic choices.[4] Modifiable cardiovascular risk factors can be reduced by various methods of rehabilitation and more intensive drug treatment during and after hospitalization. The prognostically favorable effect of

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secondary prevention in patients with proven coronary heart disease has been demonstrated. Data on impressive improvements in the prognosis and clinical progress of patients with coronary heart disease (CHD) through consistent reduction of risk factors and administration of cardio protective drugs have led to the formulation of guidelines by professional associations.[5] Based on the results of clinical trials, the guidelines of international societies recommend secondary prevention in these patients.[6] Several surveys have shown that the application of these guidelines in clinical practice is not adequate.[5]

Prospective randomized control trials show that beta-blockers, aspirin, angiotensin-converting enzyme (ACE) inhibitors and lipid-lowering agents improve survival rates after myocardial infarction (MI).[7] It is now recommended that these agents be ordinarily prescribed for all survivors of acute MI[8]; nonetheless, these agents are routinely under-utilized.[5] The aim of this study was to evaluate the prescription ratios of these drugs after hospital discharge in Iranian patients by the physicians and to compare them with the global standards.

Materials and Methods

This descriptive cross-sectional retrograde study was designed to evaluate the ratio of prescribed drugs with beneficial effects on cardiovascular mortality and morbidity for patients discharged from the hospital after a myocardial infarction. The studied population consists of the patients admitted to Shiraz University hospitals (Namazi and Faghihi hospitals) from March 2000 to March 2001 with the final diagnosis of myocardial infarction (MI), according to the WHO criteria for MI. the patients were selected by a multistage sampling method, through stratification by hospitals and a randomly selected sample from each hospital via the medical recording files. The selected patients comprised 912 individuals (582 males and 330 females). Trained medical students gathered information regarding age and sex of the patients, location and type of infarction, coronary risk factors and the kind of prescribed drugs from the medical recoding files according to a standard questionnaire. The obtained data were analyzed with SPSS-WIN version 9 software. To evaluate the probable relationships between different prescribed drugs and the other parameters, we used Chi-square test and student t-test. Predictive values equal to or less than 0.05 were considered as statistically significant.

Results

This study consisted of 912 randomly selected patients (582 males and 330 females) with the mean age of 61 ± 12 years. The mean age of myocardial infarction in men (59 ± 12 years) was lower than that in women (64 ± 11 years). Patients in the 60-69 years age group had the highest frequency of MI in the studied patients and the lowest observed frequency was in the less than 40- year- old group. The anterior wall was the most frequent site of myocardial infarction and the posterior wall was the least frequent site. There were no statistically significant relationships between the locations of MI and age groups or sex.

The main goal of this study was to evaluate the frequency of prescribed drugs which reduce post-myocardial infarction morbidity and mortality. It was observed that 88.6 percent of the patients received aspirin; 76.3 percent received beta-adrenergic blocking agents; 53.5 percent received angiotensin-converting enzyme

inhibitors; and 9.4% received lipid-lowering agents or statins (Fig.1).

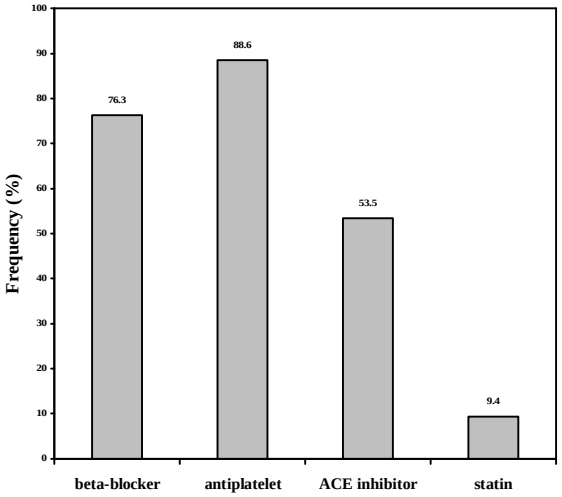

Fig. 1. Prescription frequency of drugs in post-myocardial infarction patients.

The most frequently administered drug combination was aspirin plus beta-adrenergic blocking agents and ACE inhibitors (in 35% of patients, most of whom were patients with congestive heart failure) and the least frequently prescribed one was the combination of beta-adrenergic blocking agents and statins (0.1% of patients; Fig. 2).

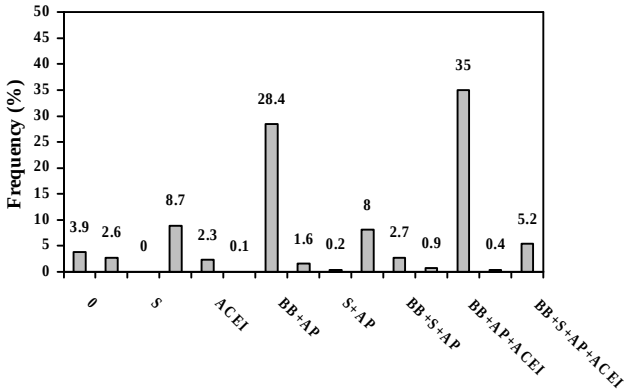

Fig. 2. Frequency of different drug combinations in the studied patients. 0: no drug; BB:beta-blockers; S: statins; AP: anti-platelets; ACEI: ACE inhibitors.

The most frequently observed risk factors were four modifiable factors: systemic hypertension, cigarette smoking, diabetes mellitus and hyperlipidemia (in 38; 33.9; 21.6; and 17.8 percent of the studied patients, respectively). There were statistically-significant relationships between cigarette smoking and beta-adrenergic blocking agent administration (i.e. in the patients who smoked cigarettes, the prescription rate of beta-adrenergic blocking agents was higher than that of non-smokers; *p*-value=0.034); hyperlipidemia and statins administration (only 18.5% of the patients who had hyperlipidemia received statins but this ratio in patients with other risk factors was much lower; *p*- value=0.00001); and finally, hypertension and ACE inhibitors administration (*p* value=0.00001). There were no such relationships between other risk factors and the administered drugs. (Fig. 3).

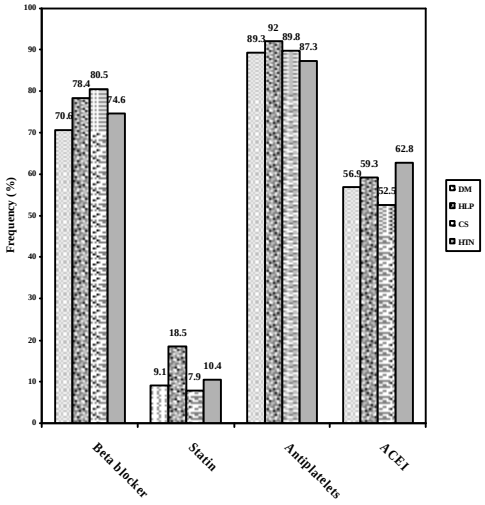

Fig. 3. Distribution of drugs administration according to risk factors. DM: Diabetes mellitus, HLP: hyperlipidemia, CS: cigarette smoking, HTN: hypertension, ACEI: angiotensin-converting enzyme inhibitor.

Discussion

Observed sex ratio of patients and their mean age were similar to those of the other reports.[9] The difference between the mean age of male and female patients is also expected and is reported in other studies.[10]
The major observed risk factors were also similar to those in the other studies.[5,7,10] In a study performed by Voller et al. in Berlin in 1997, the most frequently observed risk factors were hyperlipidemia, hypertension and cigarette smoking, but their frequency was different from that observed in the present study.[5] In another study performed by the European Society of Cardiology survey of secondary prevention of coronary heart disease, the most frequently observed risk factors were the same as the above-mentioned risk factors but with different frequencies.[11] These differences in the prevalence of risk factors may be due to ethnic or racial differences or differences in dietary habits in Iran and European countries.
World Health Organization and American Heart Association[2,3] recommend that 90 percent of patients with myocardial infarction receive anti-platelet agents and 80 percent of them receive beta-adrenergic blocking agents, ACE inhibitors and statins. But the observed frequencies of prescribed drugs were far lower than those recommended, with the exception of anti-platelet agents, whose prescription ratio was comparable to the recommended ratio. However, the ratio of prescribing these drugs in different reports from different parts of the world were also lower than that recommended,[1,7,10-14] and somehow comparable with these ratios in this study. This is especially true for statins, the prescription ratio of which in all of the reports was far lower than that recommended. For example, in the study conducted by Silber et al., only 89% of patients were on ASA (or clopidogrel); 51% on lipid lowering drugs (46% on statins); 65% on beta blockers; and only 43% had an ACE-inhibitor in their prescription.[1] In another study by Ghosh et al., of 77 individuals with CAD, 48 patients (62%) were treated with aspirin, 45 patients (58%) with ACE inhibitors or angiotensin II type 1 receptor blockers, 44 people (57%) with beta-blockers, 21 people (27%) with calcium channel blockers and 16 people (21%) with statins. Of the 61 individuals with CAD not treated with statins, serum low-density lipoprotein (LDL) cholesterol was measured in only 22 (36%) and was increased in 14 of the 22 patients (64%).[13] Other studies also reflect the same shortage in the prescription of the drugs.[7,10-12] It must be pointed out that in more recent studies, these ratios are becoming closer to the recommended ratios.[15] For example, in a study performed by Underwood et al., the ratio for ASA, beta-blocking agents and ACE inhibitors had reached to 100 percent, 84 percent and 97 percent, respectively, but the ratio for statins was 66 percent.[14] It is also of importance that according to the study performed by Mitra et al., these frequencies fall significantly after a 24-month follow-up period.[7]

Conclusion

Finally, considering the fact that anti-platelet drugs, beta-adrenergic blocking agents, ACE inhibitors and statins increase survival and improve the outcome after myocardial infarction, and considering the fact that their prescribed ratio for these patients in practice is less than optimal (especially for statins), it is recommended that physicians be made more aware of their benefits for patients. Also, it is recommended that the long-term prescribed ratio of these drugs be evaluated

for a better management and follow- up of deficiencies in their use.

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