Effect of statins and the clinical nursing characteristics in patients with acute myocardial infarction

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Abstract: Statins are widely used in clinical practice because of their effectiveness and evidence-based medical evidence. In this paper, the effect of different kinds of statins on the treatment of patients with acute myocardial infarction has analyzed. By analyzing the clinical data of patients with acute myocardial infarction in our hospital, the authors summarized the characteristics of clinical nursing of statins. At the same time, this study retrospectively investigates the female patients with acute myocardial infarction treated in our hospital. Compared with the standard regimen, the enhanced statin lipid-lowering regimen is protective in reducing mortality and cardiovascular events for patients with diagnosed acute coronary syndrome (ACS). The morbidity of female patients with acute myocardial infarction is lower than the male, it also has larger concealment. The nursing staff should have a rapid identification and triage to female patients with acute myocardial infarction and have a health education of knowledge of acute myocardial infarction.

Keywords: Statins medicine, clinical characteristics, female patients, myocardial infarction.

INTRODUCTION

Hyperlipidemia is a major risk factor for coronary heart disease, because of statins effectiveness and evidence-based support and widely used in clinical test, 4S established the importance of hyperlipidemia in patients with coronary heart disease combined intervention (Dagher et al., 2015; Isorni et al., 2015). We should take full account of the serum lipid profile of patients after ACS and start the fasting blood lipid test as soon as possible after admission. Among them, the patients with acute myocardial infarction after admission to start lipid-lowering therapy, especially the use of statins, has become the basis of drug treatment and one of the most important measures (Perl et al., 2015). There are other independent of the effects of lipid-lowering effect of statins, known as statins, including anti-inflammatory, antioxidant, improve endothelial function, plaque stabilization, reduction of neuroendocrine activation (Savonitto et al., 2012). Compared with the standard regimen, the enhanced statin lipid-lowering regimen may be more protective in reducing mortality and cardiovascular events in patients with newly diagnosed acute coronary syndrome (ACS). At present, only REVERSAL studies have shown that atorvastatin 80mg daily oral intensive lipid-lowering treatment can completely prevent the progression of atherosclerosis.

Acute myocardial infarction is one of the diseases to causes death (González-Pacheco et al., 2015; Heer et al., 2015). The female morbidity is lower than the males in the middle age. But with the increase of age, the difference is narrowed gradually (Bruera et al., 2015; Bulut et al., 2015; Buyukhatipoglu et al., 2015). The death toll of acute myocardial infarction between female and male are the same. Because the female patients have atypical symptoms and they will be ignored by the seldom signs of disease, the treatment is delayed (Cirak et al., 2015; De Carlo et al., 2015; Vagnarelli et al., 2015). It increases the fatality rate and disability rate. The paper analyzes the clinical character and prognosis as well as the gender such relationship of 541 cases patients to explore the key point and the content of the nursing intervention in early stage of acute myocardial infarction.

MATERIALS AND METHODS

There were total 540 cases of patients with acute myocardial infarction from Jan., 2010 to Jan., 2013. All projects were approved by the ethics committee of the hospital, signed with informed consent. Ethical Approval number as 2010SD57PQ. They were diagnosed according to clinical performance, electrocardiogram performance, myocardial enzyme spectrum or coronary angiogram. The last follow-up was closed in Sep. 2016. We have done the comparison analysis of the differences between female and male patients in treatment and prognosis.

Drug intervention

The venous blood (5ml) was collected from the hospital admitted patients. The four groups on the day of admission were given atorvastatin 20mg, atorvastatin 40mg, fluvastatin 80mg and rosuvastatin 10mg orally at the same time, according to the condition of antiplatelet, anticoagulation, heart rate control and other drug treatment.

Collection and storage of blood samples

Patients in CCU ward immediately after venous blood (5ml), using random number table method. The subjects
were randomly divided into four groups. The patients were randomly assigned into the group and were given the corresponding statin drugs. After taking the drug for one week and four weeks, 10 hours of fasting blood 5ml. All blood samples were collected at 4 DEG C for about 60min, and then centrifuged with 3000r/min for 10min, the supernatant was collected and stored in a -70°C ultra low temperature refrigerator to be tested.

RESULTS

Comparison of the four groups before treatment
The result shows that, there was no statistically significant difference for LDL-C (mmol/L), HDL-C (mmol/L), TC (mmol/L), hs-CRP (mg/L) and IL-6 (pg/ml). The medication for a week before and after treatment compared to the baseline LDL-C levels of the four groups was decreased (P<0.05). The result shows that HDL-C level increased in Atorvastatin group (P<0.05), and HDL-C has no significant change in fluvastatin group (P>0.05). TC levels in the four groups were all decreased (P<0.05); hs-CRP in 40mgatorvastatin group was decreased (P<0.05). For IL-6 atorvastatin group and fluvastatin group, there was no significant difference before and after treatment (P>0.05), 40mg atorvastatin group and rosuvastatin group after treatment before the reduction (P<0.05). Before and after treatment, compared with baseline, the LDL-C, TC, hs-CRP and IL-6 of the four groups were decreased (P<0.05); the levels of HDL-C in the four groups increased (P<0.05). The results are shown in figs. 1-4.

Comparison between four groups after four weeks of treatment
After one week of medication, the comparison between the four groups 20mg atorvastatin group and fluvastatin LDL-C statin group had no significant difference between the reduced value (P>0.05), fluvastatin group and rosuvastatin was no statistical difference between the Atorvastatin group (P>0.05), but rosuvastatin reduced the effect of LDL-C is better than atorvastatin group 20mg (P<0.05), atorvastatin group 40mg is stronger than the other three groups (P<0.05); 20mg atorvastatin group, rosuvastatin group decreased HDL-C values showed no significant difference (P>0.05); the four group TC decreased no statistical difference (P>0.05); 20mg atorvastatin group and fluvastatin group. Rui rosuvastatin group increased hs-CRP value had no significant difference (P>0.05); for IL-6, the four groups had no statistical difference of IL-6 change (P>0.05). Results see table 1. After four weeks of treatment, the LDL-C, TC, hs-CRP, IL-6 levels were not statistically different between the four groups (P>0.05), HDL-C value was not statistically significant (P>0.05). Results see table 2.

Clinical characteristics of acute myocardial infarction
The table 3 shows there are some similar risk factors for acute myocardial infarction in female and male, such as family history, type 2 diabetes mellitus, hyperlipidemia, western style of life, etc. But in the aspect of hypertension and obesity, the female is higher than the male. The result of table 1 shows that there are more than half of female patients will have atypical angina pectoris when the acute myocardial infarction attacks. The typical ECG changes is obviously lower than the male patients, which leads to the
fact that obviously prolonged admission and the time of
diagnosis and the misdiagnosis rate was higher than the
male patients. Seen from the table 4, the incidence of
mortality and rate of serious complication (cardiac shock,
severe heart failure, ventricular septal perforation and
papillary muscle rupture) of the female patients are higher
than the male patient. Seen from the fig. 5, the long-term
survival outcomes of female patients is lower than the
male patients (P =0.000).

DISCUSSION

Clinical trials have demonstrated that inhibition of
endogenous cholesterol synthesis by using HMG-Co a
reductase inhibitors (statins) may reduce the incidence of
primary and secondary cardiovascular events in people
with cardiovascular risk (Clemmensen et al., 2011). 
Currently, there are six types of marketed statins: 
lovastatin, simvastatin, pravastatin, fluvastatin, 
atorvastatin and rosuvastatin (Dagher et al., 2015; Isorni 
et al., 2015). Each drug is very effective, reducing the risk
of cardiovascular disease in 30-50% according to the dose
and clinical background. Coronary atherosclerosis is an
inflammatory response, and vascular inflammation plays
a key role in the pathogenesis of atherosclerosis and
thrombosis (Perl et al., 2015). Hs-CRP and IL-6 are
important indicators reflecting the inflammatory response
of coronary atherosclerotic lesions, and can well reflect
the degree of coronary artery inflammation in patients
with acute myocardial infarction (Khera et al., 2015). In
the acute phase of ACS, a series of changes in serum lipid
metabolism, plasma triglyceride and low-density
lipoprotein levels increased, HDL-C, LDL-C and total
cholesterol levels decreased. The changes of serum lipid
levels in patients with acute myocardial infarction may be
consistent with the trend. In this process, the relationship
between inflammation and lipid metabolism is very close
(Savonitto et al., 2012). Statins because of its
effectiveness and evidence-based support and widely used
in clinical, in addition to lipid-lowering effect, its
pleiotropic effects including anti-inflammatory,
antioxidant, improve endothelial function and plaque
stabilization, reduction of neuroendocrine activation. The
anti-inflammatory effect of statins is one of the important
mechanisms to improve the prognosis of cardiovascular
events.

The pathogeny of acute myocardial infarction is unclear
and it is often caused by many elements working on different parts (fig. 6 to fig. 9). The elements are called as dangerous element and susceptible factor. Acute myocardial infarction is one of the most serious clinical event happened in the pathological basis of coronary atherosclerotic heart disease (Clemmensen et al., 2015; Galasso et al., 2015; Dagher et al., 2015; Isorni et al., 2015; Khera et al., 2015; Solinas et al., 2015; Savonitto et al., 2012; Perl et al., 2015). The acute myocardial infarction and unstable angina pectoris are called as acute coronary syndrome. The study shows that there are many similar or common danger elements between the male patients and the female patients. Some danger element will increase the incident of female patients with acute myocardial infarction, such as high blood pressure, smoking, diabetes, obesity. However, because of the atypical symptoms and signs of the female attacked by acute myocardial infarction, the treatment is delayed and the prognosis is worse. Some studies show that the female mortality is two times of the male’s within one year after the attack of acute myocardial infarction (Han et al., 2015; Hou et al., 2015; Jia et al., 2015; Singh et al., 2016). The male patients are superior to the female patients in acquiring the acute myocardial infarction related knowledge. So many male patients start to do the prevention and treatment and get some effect earlier (Aldeas et al., 2015; Bal et al., 2015).

![Artery](image)

**Diabetes** is one of the common danger elements that make female being attacked by acute myocardial infarction (Guo et al., 2015; Gu et al., 2015). Diabetes can increase the risk of acute myocardial infarction in women by 7 times. Female patients of diabetes will lose the protective effect of estrogen in the pre-menopausal period completely, but it can be controlled if it is found timely. The paper also finds that the diabetes is one of the major risk factors of acute myocardial infarction after high mortality. So the postmenopausal women should check the blood sugar in each year. If it is diagnosed as diabetes, there should be diabetes diets immediately and choose the suitable hypoglycemic agents with the guidance of doctor (Abu, 2017; Fang and Ruan, 2017; Liu et al. 2017; Takahashi, 2017). Hypertensive is also dangerous in female and male. It is a common dangerous element in old women. In the old female patients with acute myocardial infarction who are older than 70 years old, 50% of them have hypertensive. If the women have hypertensive disease before menopause, the chance of being attacking by acute myocardial infarction is added (Hess et al., 2016; Kong et al., 2015). The healthy people with family history should have prevention of all kinds of danger elements actively and monitor the blood pressure regularly.

Hyperlipidemia hyperlipidemia is one of the danger elements that cause the acute myocardial infarction (Akhter et al., 2009; Caziuc et al., 2015; Cetean et al., 2015; Chen et al., 2015; Kawamoto et al., 2016). It is reported that the higher triglyceride levels play an important role in the development of acute myocardial infarction (Chandrasekhar et al., 2016; Claassen et al., 2012; Hochman et al., 1999; Presbitero et al., 2003; Trzeciak et al., 2016; Tillmanns et al., 2005; Vogel et al., 2016). When female has higher blood fat, the risk of acute
myocardial infarction will increase 3 times. So, the susceptible population of acute myocardial infarction should be actively guided in the diet to control the high fat food intake. The main nutritional components of serum total cholesterol are saturated fatty acids and dietary cholesterol. Hence, the main thing of diet guidance is to reduce the intake of saturated fatty acids and cholesterol.

**CONCLUSION**

In patients with acute myocardial infarction (AMI), lipid regulating therapy, especially the use of statins, has become one of the most important measures for the treatment of acute myocardial infarction. There are other independent of the effects of lipid-lowering effect of statins, known as statins, including anti-inflammatory, antioxidant, improve endothelial function, plaque stabilization, reduction of neuroendocrine activation. Compared with the standard regimen, the enhanced statin lipid-lowering regimen may be more protective in reducing mortality and cardiovascular events in patients with newly diagnosed ACS. The nursing staff should have a rapid identification and triage to female patients with acute myocardial infarction and have a health education of knowledge of acute myocardial infarction.

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<th>Table 3: Characteristics of acute myocardial infarction in female and male</th>
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<td>Mortality</td>
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Acknowledgements

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References


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