



RESEARCH ARTICLE

RESEARCH PROGRESS OF ETHNIC MEDICINE IN THE TREATMENT OF MYOCARDIAL ISCHEMIA-REPERFUSION INJURY

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ABSTRACT

The treatment of myocardial ischemia-reperfusion injury is the focus and difficulty of researchers and clinicians. With the aging of the population, the incidence of myocardial infarction is increasing year by year. At the same time of modern medical treatment of myocardial infarction, scholars pay more and more attention to the role of traditional Chinese medicine in the treatment of myocardial ischemia-reperfusion injury in order to greatly reduce the harm of myocardial ischemia-reperfusion injury. Among them, as an important part of traditional Chinese medicine, the efficacy of ethnic medicine in the treatment of myocardial ischemia-reperfusion injury has been affirmed by many people. In order to fully explore the medicinal value of ethnic medicine in the treatment of myocardial ischemia-reperfusion injury, the author reviews the recent research on ethnic medicine in myocardial ischemia-reperfusion injury, in order to provide reference for clinicians and researchers to do further research.

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INTRODUCTION

Myocardial Ischemia Reperfusion Injury (MIRI) refers to the significant pathophysiological changes of myocardial cells and local vascular network in the reperfusion area caused by myocardial ischemia after intravenous thrombolysis and percutaneous coronary intervention. These changes can lead to further tissue damage together (Chen L.L., 2013). The mechanism of its occurrence is currently considered to be related to oxygen free radicals, Ca^{2+} overload, white blood cells, lack of high-energy phosphoric compounds and so on. At present, the drugs for preventing MIRI mainly play a role in reducing oxidative damage of cardiac myocytes, reducing calcium overload of cardiac myocytes and regulating energy metabolism of cardiac myocytes (Tan L.Q., 2018). With the increasing incidence of myocardial infarction, in order to prevent the great damage caused by MIRI, it is urgent to find an economical and effective treatment. Ethnic medicine is a kind of medicine used by various minority nationalities and guided by their theory and practice of ethnic medicine. Folk doctors widely use ethnic medicine to treat heart disease, which can get good curative effect. In recent years, scholars have increasingly focused on the research of ethnic medicine in the treatment of MIRI. In order to further tap the medicinal value of ethnic medicine on MIRI, the author summarized the

research on MIRI of ethnic medicine in recent years, in order to provide a theoretical basis for the future clinical application and experimental research on the prevention and treatment of MIRI of ethnic medicine.

Tibetan Medicine and Prescription

Oxytropis Falcate Bunge

Oxytropis falcate Bunge is the whole grass of *Oxytropis falciformis* and *Oxytropis microphylla*. It tastes bitter and sweet, tastes bitter after digestion, has cool nature and is poisonous; belongs to the lung and spleen meridians; has the functions of clearing away heat and toxic material, to relieve swelling and pain, benefit fecal stool, healing sores and muscle, astringent pulse and hemostasis; it mainly treats pestilence, sore throat, constipation syndrome, and external application to treat sores and swelling pain; belongs to one of the "three anti-inflammatory drugs" of Tibetan medicine, known as the "king of herbal medicine". Modern studies have shown that zedoary rhizome contains flavonoids, alkaloids, steroids and pentacyclic triterpenoids, etc. Pharmacological studies have proved that it has anti-inflammatory, anti-oxidation, detoxification, eliminating the heart-fire, anti-cancer effects (Zhang Y., 2014). Li Z. *et al.* (2014) observed the effect of *Oxytropis falcate Bunge* on MIRI by replicating MIRI model in vivo. It was found that *Oxytropis falcate Bunge* alcohol extract could

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significantly reduce the increase of CK and LDH induced by MIRI. The high, middle and low dose groups of *Oxytropis falcate* Bunge alcohol extract could increase the activity of endogenous antioxidants SOD and GSH-Px, reduce the production of lipid peroxidation product MDA, and had a significant effect with the increase of dose through microscopy. It was found that the extent of contractile zone injury was significantly alleviated, indicating that the alcohol extract of *Oxytropis falcate* Bunge could inhibit the production of free radicals and enhance the activity of endogenous antioxidant system during reperfusion, and play a protective role in myocardial ischemia-reperfusion injury. In addition, Li Z.(2012) also proved that *Oxytropis falcate* Bunge can significantly reduce the elevation of S-T segment of ECG, decrease the release of LDH and CK in serum during ischemia-reperfusion period, significantly enhance the activity of SOD and GSH-Px in myocardial tissue, and reduce the content of MDA, thus playing a protective role in MIRI. Du H.*et al*.(2013) studied the effect of *Oxytropis falcate* Bunge on Bcl-2 and Bax expression in myocardial ischemia-reperfusion injury in rats. It was found that *Oxytropis falcate* Bunge may play a protective role against ischemia-hypoxia injury by promoting the expression of Bcl-2 protein and inhibiting the expression of Bax protein in MIRI. Zhang D.J.*et al*(2013). made MIRI model by ligating the left anterior descending branch of the coronary artery in rats. The NO content and the activity of NOS and iNOS in myocardium were measured 40 minutes after reperfusion. The results showed that after myocardial ischemia and reperfusion, the content of NO and NOS in myocardium increased significantly, so, *Oxytropis falcate* Bunge has protective effect on MIRI in rats by reducing the activity of NOS and iNOS and the level of NO content. Yuan W.T. *et al*(2017). through the analysis of active components of Tibetan medicine *Oxytropis falcate* Bunge in improving MIRI in rats, concluded that: *Oxytropis falcate* Bunge participates in the metabolic process in vivo mainly flavonoids, which may include methylation and hydroxylation reaction; and that total flavonoids may be the main effective ingredients of *Oxytropis falcate* Bunge in Pharmacological and pharmacodynamic effects. Ma Y.L.(2017) studied Tibetan medicine *Oxytropis falcate*, and concluded that it could improve the viability of hypoxia/reoxygenation H9c2 myocardial cells and protect against hypoxia/reoxygenation injury, but the mechanism was not related to Caspase-3.

Herba Rhodiolae

Tibetans call *Herba Rhodiolae* "Solomab", which was first found in the Four Medical Codes. It is the root and rhizome of *Rhodiola Dahua* and *Rhodiola Tanggute*, it is sweet, bitter, astringent and slightly cold in nature. It has the functions of promoting blood circulation and detumescence, removing heat from the lung to relieve cough, relieving fever and pain, benefiting qi for tranquillization. It mainly treats nausea, vomiting, purple lips and palms caused by the climate does not suit one. The chemical constituents contain salidroside, mauritidine, pyrogalllic acid, gallic acid, etc. They have pharmacological effects on the nervous system and cardiovascular system and hypoxia tolerance. Salidroside in *Herba Rhodiolae* can improve myocardial function, affect myocardial enzyme activity and expression of cytokines, and

affect apoptosis (Rong H.*et al*.,2018). Some studies have shown that salidroside can change the range of S-T segment of electrocardiogram in MIRI rats, reduce the area of acute myocardial infarction, reduce the degree of myocardial inflammatory infiltration and necrosis in ischemia-reperfusion group (Zhang Z.P.*et al*.,2006; Liang X.Q.*et al*.,2010). It can significantly reduce the degree of myocardial ischemia and the extent of myocardial ischemia (Ma Y. *et al*.,2007), enhance the contractility of isolated myocardium in rats with acute myocardial ischemia/reperfusion injury, and has positive myodynamic effect (Lei S.F. *et al*.,2015). It can reduce left ventricular end-diastolic pressure (LVEDP), increase left ventricular development pressure (LVDP), maximum rate of change of left ventricular systolic pressure(+dP/dtmax) and left ventricular diastolic period in isolated myocardial ischemia/reperfusion injury heart pressure lowers the maximum change rate (-dP/dtmin), increases circulating blood flow, and increases tissue energy supply (Gao Y.F. *et al*.,2010). Salidroside can also reduce the activity of phosphoinositide (CK) and MDA content, increase the activity of SOD and NOS; pretreatment with MIRI model can significantly increase the activity of CAT and SOD, and decrease the content of MDA in rat serum; salidroside can inhibit the activity of creatine kinase (CK) and lactate dehydrogenase (LDH) in serum and myocardium of rats with ischemia-reperfusion injury, and also reduce NO. The activity of superoxide dismutase (SOD) was increased simultaneously with the content of malondialdehyde (MDA).It can also reduce the content of NO and malondialdehyde (MDA) and increase the activity of superoxide dismutase (SOD)(Jia Z.,2015).Salidroside preconditioning can significantly increase the expression of FLK-1, HIF-1 α and VEGF genes and protein in rat myocardium(Wang W.J. *et al*.,2015). It can also decrease the levels of TNF- α , IL-1 β , IL-6 and ET in rat serum(Liang X.Q.*et al*.,2010) it can also increase the expression and phosphorylation of Akt/GSK-3 β protein in ischemia-reperfusion myocardium, enhance the myocardial protection against ischemia-reperfusion injury, decrease the apoptotic index and Bax expression of rat myocardium, and increase the apoptotic proteins Bcl-2, Bcl-2/Bax(Jia Z.,2015; Liu X.J. *et al*.,2015).

Compound Sadunabao

Compound Sadunabao is a common Tibetan folk experience prescription, it is made of Sadunabao, saffron crocus, swampy gentianopsis herb and so on, it has a good clinical effect in treating ischemic heart disease. Beside, Sadunabao is also called Tibetan Schizonepeta, which is the whole herb of Tibetan Schizonepeta in Labiatae, it has bitter taste and cool nature, it has the function of refreshing and awakening the mind. It is mainly used for apoplexia, epilepsy, cerebral haemorrhage, sores and pain, etc. He M. *et al*.(2013) studied the protective effect of compound Sadunabao on MIRI in rats, and found that compound Sadunabao could significantly reduce the incidence of reperfusion arrhythmia, delay the occurrence of arrhythmia, shorten the duration of arrhythmia, reduce the area of myocardial infarction, reduce ST-T wave value, reduce J-point displacement, and make ST segment of ECG significantly fall back during reperfusion, it indicated that compound Sadunabao had a protective effect on MIRI.

Sanwei Tanxiangsan

Tibetan medicine SanweiTanxiangsan is composed of sandalwood, nutmeg and Guangsuanzo. Its Tibetan name is ZandanSongtang, it is a commonly used prescription of Tibetan medicine for treating cardiopyretic disease. Kou Y.Y. *et al.*(2008) studied the antioxidant effect of SanweiTanxiangsan on MIRI in rats, after pretreatment with high and low doses of SanweiTanxiangsan, the activity of SOD and GSH-Px in myocardial tissue increased significantly, and the content of MDA decreased significantly, it indicated that SanweiTanxiangsan might interfere with the production of free radicals and enhance the function of free radical scavengers, balance the oxidation and antioxidant level, blocking the chain reaction of lipid peroxidation, thus playing an anti-myocardial ischemia-reperfusion injury role. And he also proved that the effect of SanweiTanxiangsan on MIRI in rats may be related to its protection of myocardial mitochondrial structure, improvement of myocardial energy metabolism and elimination of lipid peroxides, reduction of NOS and iNOS activities in myocardium and reduction of NO excessive release (Kou Y.Y., 2008).

Siwei Horseradish Cabbage Decoction Powder

Siwei Horseradish Cabbage Decoction Powder is composed of Alpine Horseradish Cabbage, Lithospermum, Ligadu and liquorice. It has the functions of nourishing Yin and clearing heat, cooling blood and hemostasis. Bao S.L.(2016) experiment confirmed that the protective effect of it on MIRI may be through inhibiting the production of free radicals, enhancing the function of free radical scavengers, maintaining the dynamic balance of oxidation and antioxidation of myocardial cells, protecting the integrity of myocardial mitochondrial structure and enhancing the oxidative phosphorylation of myocardial mitochondria by regulating intracellular to achieve the protective effect of MIRI in rats. As for the specific effective process and signal transduction pathway of Tibetan medicine Siwei Horseradish Cabbage Tangsan intervention, further research is needed.

WuweiYuganzi Powder

Wuwei Yugan Zisan, a prescription of Tibetan medicine, is a "JuruNie Ze" prescription of Tibetan Medical College of Qinghai University revised in "Selected Works of Dima Medicine". It is composed of Yugan Zi, Tibetan Caragana, Corydalis Saibei, Rhubarb and dried ginger, It has the functions of eliminating pathogenic heat from the blood, removing blood stasis and dredging pulse, relieving chest pain, and treating angina pectoris, hypertension and hyperlipidemia with remarkable curative effect. Tan G.S.(2014)Studied the protective effect of WuweiYuganzi Powder on MIRI, it was observed that WuweiYuganzi Powder could decrease the levels of LDH and CK in serum of MIRI rats, increase the activity of SOD and GSH-Px in myocardium, decrease the content of MDA, increase the level of NO in myocardium of MIRI rats, increase the activity of iNOS and tNOS in myocardium, and inhibit the expression of Bcl-2 and Bax protein by regulating WuweiYuganzi Powder. In addition, it can improve the myocardial ultrastructure of ischemia-reperfusion injury in varying degrees.

Mongolian Medicine Prescription

Guanxinshutong Capsule

GuanxinShutong Capsule is a new Mongolian medicine developed, developed and promoted by Xianyang Buchang Pharmaceutical Co., Ltd, it is developed by combining the theoretical knowledge of traditional Chinese medicine with the unique theory of Mongolian medicine. It has the functions of activating blood circulation and removing blood stasis, activating meridians and collaterals, traveling Qi and relieving pain. Wang J.(2013) through the experimental study of the effect of Guanxinshutong Capsule on apoptosis of MIRI in rats, the results showed that Guanxinshutong Capsule could protect myocardial cells by inhibiting apoptosis of myocardial cells, down-regulating the expression of gene protein Bax and up-regulating the expression of gene protein Bcl-2 in MIRI. YaoT.M. *et al.*(2012) experiment for the first time explored the protective effect of Guanxinshutong Capsule on MIRI in rats. The effect of Guanxinshutong Capsule on reducing myocardial injury marker, myocardial enzymes, may be related to its anti-oxidative stress. The experiment also proved that it could effectively reduce the concentration of MDA and iNOS in serum of rats after ischemia-reperfusion injury, and increase the activity of SOD, TNOS and NO. Ao U.L.J.(1998) also confirmed that Guanxinshutong Capsule could reduce the content of MDA, the end product of lipid peroxidation, and enhance the antioxidant capacity, which was one of the ways to protect MIRI in rats. In addition, it could significantly reduce the severity of arrhythmia, the number of premature ventricular beats and the total duration of ventricular tachycardia and ventricular fibrillation after reperfusion were significantly reduced.

Guangzao

Guangzao is the fruit of Nanzao jujube, a lacquer tree plant; it tastes sweet, sour and has the effect of clearing heart and strengthening heart; it mainly treats heart fever, palpitation, tingling heart, madness, syncope, heart hey, heart failure and other symptoms; Tang X.L.(2013) studies have proved that the effective substances of Guangzao based on small molecules of organic acids, phenolic acids and flavonoids; and its organic acids, phenolic acids and flavonoids are three main categories of anti-MIRI. These components can directly protect myocardium from ischemia-reperfusion injury by activating phosphorylation of Akt and inhibiting apoptosis of myocardial cells. Date flavonoids (quercetin and kaempferol) can inhibit the secretion of inflammatory factors such as TNF- α , IL-1 β , IL-6 and IL-18 by cardiac fibroblasts by inhibiting activation of Akt/NF- κ B signaling pathway and alleviating paracrine inflammation during myocardial ischemia-reperfusion. The release of Zygote has indirect protective effect on MIRI.

Mongolian Medicine Huanglian-4 Decoction

Mongolian medicine Huanglian-4 Decoction is one of the traditional prescriptions of Mongolian medicine. It has the functions of clearing heat and detoxification, preventing heat from dryness and regulating Heyiqisu combat. The protective effects of Mongolian medicine Huanglian-4 Decoction on cTn-I, CK and LDH in SD rats with MIRI were studied by HaburiJinet *et al.*(2017), and he results showed that the serum CK, LDH and cTn-I levels in Huanglian-4 Decoction group were

significantly decreased, indicating that Huanglian-4 decoction had protective effects on MIRI, and its mechanism was related to the contents of myocardial enzymes CK, LDH and cTn-I. Li P. *et al.*(2017) confirmed that Mongolian medicine Huanglian-4 Decoction may reduce the content of inflammatory factors TNF-alpha and IL-6 in MIRI, improve its inflammatory state and achieve the purpose of protecting the heart. However, the specific mechanism, effective ingredients and monomers of the compound still need to be further studied in order to provide more scientific basis for Mongolian medicine in the treatment of myocardial ischemia-reperfusion injury.

Mongolian Medicine Nutmeg

Nutmeg, a Mongolian medicine, is the seed of Nutmeg, a plant of Nutmeg family, it has the functions of inhibiting Heyi, regulating stomach fire, eliminating food and appetizing the appetite. It mainly treats heart Heyi, heart stabbing pain, faint. Wang Y. *et al.*(2010) by observing the protective effect and mechanism of nutmeg volatile oil on MIRI in rats, he found that nutmeg volatile oil could reduce the incidence of heart rate and arrhythmia in rats with MIRI, the elevation of ST segment, the release of myocardial enzymes GOT, CK and LDH, as well as oxygen free radicals and polyunsaturated fat on cell membrane. The content of MDA, the product of lipid peroxidation, increased the activity of SOD, suggesting that nutmeg volatile oil has protective effect on ischemia-reperfusion injury in rats. Its mechanism may be to protect myocardium by inhibiting the production of oxygen free radicals, inhibiting lipid peroxidation, reducing damage to myocardial cells, maintaining the normal permeability and integrity of cells, alleviating myocardial ischemia, and inhibiting arrhythmia caused by reperfusion.

Mongolian Medicine Zachong Thirteen-flavor Pills

Zachong Thirteen-flavor Pills is recorded in Mongolian Medical Classics. It is one of the traditional prescriptions commonly used in Mongolian medicine clinic. It is mainly used for cardiovascular and cerebrovascular diseases, and nervous system diseases. It is a special prescription for cerebrovascular diseases and rheumatism, such as cerebral thrombosis, cerebral infarction, cerebral atrophy, cerebral apoplexy hemiplegia, and unclear speech(Han G.Z. *et al.*,2007). Peng C.M.*et al.*(2013) have studied the protective effect of Zachong Thirteen-flavor Pills on myocardial ischemia-reperfusion injury in rats. It is confirmed that Zachong Thirteen-flavor Pills has protective effect on MIRI. It may play a protective role by enhancing the body's ability to resist oxygen free radicals and alleviating the damage of oxygen free radicals to myocardium.

Miao Medicine Prescription

Erythroside

Erythroside is considered as one of the main active ingredients of Miao medicine Dumu oil on cardiovascular system, and its research on prevention and treatment of MIRI is more in-depth. Such as:Liu L.Y.*et al.*(2015) studies found that: ①Erythroside can protect myocardial cells from hypoxia/reoxygenation injury in a dose-dependent manner; it can significantly enhance the viability of myocardial cells damaged by

hypoxia/reoxygenation, reduce the leakage of LDH and CK-MB in myocardial cells, and significantly improve the morphological and ultrastructural changes of myocardial cells damaged by hypoxia/reoxygenation.②The protective effect of erythroside on hypoxia/reoxygenation injured cardiomyocytes is related to activation of PI3K-Akt signaling pathway. One of its possible protective mechanisms is to phosphorylate the Ser234 site of Beclin 1 through activation of Akt, thus preventing Beclin 1-mediated cardiomyocyte autophagy. ③Erythroside can inhibit cardiomyocyte apoptosis induced by hypoxia/reoxygenation injury by up-regulating the expression of Bcl-2. ④Erythroside can induce moderate autophagy of cardiac myocytes through AMPK-mTORC1 signaling pathway and exert its anti-hypoxia/reoxygenation effect on cardiac myocytes. ⑤Erythroside can also inhibit the phosphorylation of Bcl-2 and Bcl-XL and enhance the binding of Beclin1 to Bcl-2 in endoplasmic reticulum, thus preventing Beclin1-mediated cardiomyocyte autophagy. In addition,Wu X.X.*et al.*(2017) also confirmed that the protective effect of urticarin on rat heart ischemia-reperfusion injury may be related to its inhibition of cell autophagy through PI3K-Akt-mTOR signaling pathway. In terms of arrhythmia, Fu X.C.*et al.* (2017) studies have found that urticarin has a significant protective effect on arrhythmia in rats with myocardial ischemia/reperfusion injury. Its protective effect may be related to inhibiting peroxidation of cell membrane and scavenging oxygen free radicals. Sun X.Y.*et al.*(2018) confirmed that urticarin has obvious protective effect on mitochondria in myocardial cells of MIRI rats. The mechanism may be related to the inhibition of over-activation of mitochondrial autophagy in myocardial cells through Parkin-dependent and Parkin-independent signaling pathways.

MiaoyaoLiqiHuoxue Dropping Pills

LiqiHuoxue Dropping Pills are developed on the basis of Guizhou Miao folk prescriptions and traditional Chinese medicine theory. It has the effects of warming yang and widening chest, regulating qi and activating blood circulation. Clinical trials have proved that they have good therapeutic effects on coronary heart disease and angina pectoris (Sun G. *et al.*,2016). Li Y.F.*et al.*(2017) experimental results showed that LiqiHuoxue Dropping Pills had protective effect on MIRI, could improve the pathological changes of myocardial tissue, reduce the leakage of myocardial enzymes CK and LDH, and reduce the contents of TNF-alpha and IL-6 in serum. It also confirmed that the protective mechanism of LiqiHuoxue Dropping Pills on MIRI model rats and its improvement of left ventricular myocyte ultrastructure and inhibition, it is related to the inhibition of apoptosis and mitochondrial oxidative damage (Li Y.F. *et al.*,2018).

Miao Medicine TetrastigmaHypoglaucum Planch

Tetrastigmahypoglaucum Planch, its main effects are dispelling wind and dampness, activating blood circulation and dredging collaterals, bone-setting and muscle-building; external treatment of injury caused by falls, swelling and pain relief, for the treatment of wind-cold-dampness arthralgia, injury caused by falls, blood stasis and other diseases(Tang H.H.,2006). It found that Tetrastigmahypoglaucum Planch has protective effect on MIRI in rats, and can alleviate myocardial cell injury, oxidative

stress and inflammatory reaction, but its mechanism needs further study.

Prescription of Uygur Medicine

Aiweixin Oral Liquid

Aiweixin Oral Liquid is a preparation developed by the Pharmaceutical Research Laboratory of Hetian Uygur Medical College of Xinjiang based on the records of ancient famous Uygur doctors. Chen W.F. (2009) studies showed that Aiweixin pretreatment could significantly reduce ST-T segment elevation and arrhythmia in MIRI, significantly reduce MDA content and increase GSH-PX activity in myocardial tissue, and significantly reduce the expression of Bax and Caspase-3 gene protein in cardiomyocytes of Aiweixin pretreatment group, while the expression of Bcl-2 gene protein was significantly increased. Li J.H. (2007) found that low dose of Aiweixin could enhance the function of isolated myocardial ischemia-reperfusion in rats, protect and stabilize the myocardial cell membrane, and inhibit the apoptosis of myocardial cells. Wang R. *et al.* (2009) showed that Aiweixin oral liquid could improve the cardiac function of rats after ischemia-reperfusion, significantly reduce the contents of MDA and CK in myocardial tissue, increase the activity of GSH-PX, and reduce the morphological changes of myocardial injury. In addition, Aiweixin preconditioning has protective effects on MIRI in rats. Its mechanism may be related to the inhibition of iNOS activity and the increase of H₂S content by Aiweixin or the inhibition of lipid peroxidation and activation of ATP-sensitive potassium channel (KATP channel) (Yuan Y.M. *et al.*, 2017; Luo Y.H. *et al.*, 2012). It also can reduce MPO and MDA in MIRI rats, and the mechanism may be related to the inhibition of leukocyte aggregation and anti-membrane lipid peroxidation (Yuan Y.M. *et al.*, 2010).

Anchusa Italica Retz

Anchusa Italica Retz is a plant of Boraginaceae family. Modern pharmacological studies have shown that it has anti-myocardial ischemia-reperfusion injury effect (Xu X.N. *et al.*, 2014). Dai J.G. (2017) studies have shown that: ethanol extract of *Anchusa Italica Retz*, ethyl acetate extract, n-butanol extract, water extract, effective fraction of total flavonoids, rutin have protective effects on hypoxia/reoxygenation injury of neonatal rat cells. The mechanism may be to reduce oxidative stress injury of primary cardiac myocytes induced by hypoxia/reoxygenation by intervening in the production of balanced oxidative stress products and antioxidant stress enzymes. In addition, the effective fraction of total flavonoids of *Anchusa Italica Retz* has protective effect on myocardial ischemia-reperfusion injury in mouse, which can reduce the rate of myocardial infarction and the level of myocardial enzymes.

Uygur Medicine Abnormal Black Bile Maturity Agent

Uygur medicine abnormal black bile maturity agent is a traditional Uygur medicine preparation with modern formula, which has good antioxidant function. Abu D.M. *et al.* (2014) showed that Uygur medicine abnormal black bile maturity agent could significantly improve myocardial histomorphology and cardiac electrophysiological function of rats with myocardial ischemia/reperfusion injury in vivo, and

significantly alleviate myocardial inflammation after myocardial ischemia-reperfusion, and its efficacy was dose-dependent. The protective effect of Uygur medicine abnormal black bile maturity agent on ischemia-reperfusion injury may be better than that of Atorvastatin, but further studies are needed to confirm the protective effect of Uygur medicine abnormal black bile maturity agent on ischemia-reperfusion injury.

Zhuang Medicine Prescription

Euonymus Fortunei

Euonymus fortunei is a commonly used Zhuang medicine in Guangxi Zhuang area. It has good cardiovascular pharmacological effects, prolongs the survival time of ischemic myocardium and inhibits thrombosis in mouse (Xie J.X. *et al.*, 1999). Li C.L. *et al.* (2010) research results showed that *Euonymus fortunei* could alleviate the ultrastructural damage of myocardial cells, thereby inhibiting the myocardial cell injury induced by ischemia-reperfusion, and the protective effect was dose-effect relationship. *Euonymus fortunei* could reduce the expression of Bax protein, increase Bcl-2, and inhibit the apoptosis of myocardial cells after reperfusion (Li C.L. *et al.*, 2009). In addition, *Euonymus fortunei* could also inhibit liposome by scavenging oxygen free radicals. Oxygenation plays a protective role in myocardial ischemia-reperfusion injury, especially in the high-dose group of *Euonymus fortunei* (Li C.L. *et al.*, 2011).

Yulangsan

The original plant of *Yulangsan* is identified as the root of *Millittia pulchra Kurz var. laxior* (Dunn) Z. Wei, a butterfly flower plant. It is commonly used in Guangxi folk medicine to treat hypertension, Alzheimer's disease, fall injury and rheumatism, dyspepsia, malnutrition and post-disease weakness. Studies have shown that (Zhang X.D., 2008) *Yulangsan* has a significant protective effect on myocardial function and structure in MIRI rats, and has a dose-effect relationship. The mechanism may be related to the negative heart rate, negative inotropic effect, anti-oxidative stress injury, increase of cNOS activity, decrease of iNOS activity, up-regulation of ANTI expression, protection of Na⁺-K⁺-ATPase and Ca²⁺-Mg²⁺-ATPase activity, and inhibition of cardiomyocyte apoptosis by down-regulation of Caspase 3 expression, Bax protein expression and Bax/Bcl-2 ratio. *Yulangsan* can inhibit myocardial apoptosis and autophagy induced by ischemia/reperfusion by activating PI3K/Akt signaling pathway, thus exerting its protective effect on myocardial ischemia/reperfusion injury. Xuan F.F. *et al.* (2015) can inhibit myocardial apoptosis and autophagy induced by ischemia/reperfusion by activating PI3K/Akt signaling pathway, thus exerting its protective effect on myocardial ischemia/reperfusion injury. Lv J.H. *et al.* (2014) studies showed that *Yulangsan* water extract has protective effect on myocardial injury induced by ischemia-reperfusion. Its mechanism may be related to scavenging oxygen free radicals and inhibiting lipid peroxidation. It also proved that *Yulangsan* water extract can alleviate myocardial I/R injury in rats. The mechanism may be related to reducing calcium overload and inhibiting some apoptosis-related proteins (Lv J.H. *et al.*, 2015). Li J.L. *et al.* (2012) have shown that *Yulangsan* saponins have protective effects on MIRI, which may be related to scavenging oxygen

free radicals and reducing lipid peroxidation. Tan F.Z. *et al.* (2017) studies show that chalcone treatment can effectively improve the hemodynamic parameters of I/R heart, reduce the size of myocardial infarction, up-regulate the levels of p-JAK2 and p-STAT3, and play an anti-apoptotic role. This protective effect can be inhibited by JAK2/STAT3 signaling pathway inhibitor AG490, suggesting that JAK2/STAT3 signaling may mediate the myocardial protective effect of YLSC.

DISCUSS

Ethnic medicine is a new direction of research on new drugs. Ethnic medicine plays an important role in preventing and treating MIRI. In recent years, there are many studies on MIRI of ethnic medicine, but from the collection of literature, the excavation of ethnic medicine still needs to be further improved. At present, there are the following problems in the research of ethnic medicine: ① There are fewer records of ethnic medicine, mainly concentrated in Tibetan, Mongolian, Miao, Zhuang and Uygur ethnic medicine research, and the drugs studied are relatively single, so it is necessary to further explore the effective drugs of folk medicine research; ② The effectiveness of ethnic medicine generally comes from folk, through modern medical technology research, although the effectiveness of ethnic medicine in animal experiments has been clearly defined, there is no further clinical observation and lack of clinical data to support it; ③ Although most ethnic medicine experiments have carried out pharmacological research, the mechanism of further action is not clear. It is necessary to strengthen the research of experimental targets in order to provide theoretical basis for clinical and future experimental data. Under the background of vigorous development of traditional Chinese medicine, we should seize the opportunity, make good use of modern scientific and technological means, fully tap the wisdom left behind by predecessors, and serve future generations.

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