



RESEARCH ARTICLE

THE RESEARCH ADVANCE ON MODERN DETOXIFICATION DRUG RESEARCH METHODS

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ABSTRACT

As one of the most important public health emergencies in poisoning, it has been paid more and more attention in society, commonly including drug poisoning, viper bite poisoning, food poisoning etc. Poisonings are common in today's society, which cause varying degrees of damage to human public health. This article on the concept of the "poison" and development, poisoning mechanism, the concept of drug detoxification, antidotes classification and clinical applications, detoxification drugs mechanism of action, clinical application effect of Jiedu drugs, modern drug detoxification outlook outlines respectively. To provide guidance for the treatment and prevention of different kind of poisoning diseases.

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INTRODUCTION

With the progress of human science technology, chemical compounds are increasing, which are toxic and harmful to the human body. An increasing number of new drugs to market, more and more industrial and agricultural production are in contacted with harmful toxic substances, which are gradually increasing. In the contact process, pesticides, chemicals, Chinese herbal medicine, bacterial toxins, plant poisons and other harmful factors can produce damage to the body. In these patients, some are acute onset and severe illness.

If the treatment is not timely or properly, will cause serious consequences and even some of the damage caused by toxic substances are unknown, which will be made more difficult task for poisoning treatment. Timely and reasonable application of detoxification drug, it has played an important role in the poisoning treatment and patient rescuing. Studying on detoxification of drugs can not only help to guide clinical rational use of drug detoxification, but also are able to deal with the sudden public health incidents of poisoning, as well as better guide clinical practice.

The concept of the Ancient "Toxic"

With the development of traditional Chinese medicine, "poison" is playing an increasingly important role around the world, its connotation and extension of ongoing evolution. Ancient medical books on "the understanding and interpretation of poison", which are often different. So it is necessary to do something to explore poison interpretation and discussions. Therefore, clarifying "poison" concept in medicine, it is necessary. In medicine, the "poison" is with a very broad meaning. "Concise Dictionary of Traditional Chinese Medicine" pointed out: "poison, the name refers to the syndrome. Refers to the insidious, Yang toxin, sore, carbuncle poison and all sore "[1]. "Dictionary of Chinese medicine" [1] puts forward: ①belong to one of the causes: Sores common cause of burning, heat toxic; animal insect bites such as snake venom, rabies virus, drugs and other livestock epidemic. ②Syndrome name: The general term of ulcer, such as sore, carbuncle poison, insidious, sun poisoning, etc. ③Medicinal theory by means of drug toxicity or potency in the fierce degree. "The Basic Theory of Traditional Chinese Medicine" said that: "poison is also known as poison gas, poison, where evil can be referred to poison. In Chinese medicine, from the etiology pathogenesis, syndrome to medical treatment drugs are closely related to poison. Drug category "toxic" is that "poison" is the drug, the drug is "poison." Lieutenant in the medical books in all drug treatment are collectively referred to as the poison. In summary, the drug are mainly including the following aspects: the result

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of disease; pathogenesis; drug or drug toxicity and strong bias nature; therapeutic principle.

Many doctors studied on the "poison", they not only thought "poison" as the cause, but also thought that it can be used as the pathogenesis. Almost "poison" caused by the disease, there are two mains: the first, from the outside feelings such as direct invasion of warm toxin; the second is the deficiency of Yang or Yin and the disorders of seven emotions send the fire from the inside of health, which obstructed from poison [2]. A concept of Poison not only has material properties, but also has a concept of Pathology property. The concept of toxin is divided into broad sense and narrow sense: narrowly poison is as a special kind of risk factors, such as sugar poison, fat poison, food poisoning, insects drugs and other poisoning. Generalized poison is referred to a concept in the dual attributes of the etiology and pathogenesis. "Poison" is a general term for a class of pathogenic substances, which can be divided into external and internal toxic [3]. Poison is a or a class of pathogenic factors included external and internal of poison, poison is a kind of pathogens in a natural resource, nevertheless endotoxin is accumulated by the evil [4]. Referring to the performance of the ancient medicine in generalized drug toxicity. "Zhou Li. Tian Guan" existing professional "palmed Doctor's decree, pooled poison for pharmacy," said the Western Zhou Dynasty 2,500 years ago. Chinese medicine toxicity grading is peculiar "medicine poison" theory in our country and is also China's traditional medicine for drug toxicity and scientific application of human knowledge to which is a key initiative and a contribution. In ancient times, there was a diversity of drug toxicity grading, such as "Su Wen. Wu Chang Zheng Da Lun" said that there was "big poison" "often poisonous" "Little poison", "non-toxic" as records and drug toxicity of the definition were closely related with physicians subjective understanding. The earliest monograph of Material Medical "Shen Nong's herbal classic" recorded 365 kinds of drugs. Chinese medicine is divided into upper, middle, lower Mishina. In generally is to recover the medicine of disease becoming toxic and can be a long time medication tonic as non-toxic. "Chinese Pharmacopoeia" (2005 and 2010 edition) will be in accordance with poisonous size of the traditional Chinese medicine into big toxicity, toxic, less toxic three levels. The traditional classification methods for toxicity grading experience of modern Chinese medicine still take over the ancient herbal books. "Dictionary of Chinese medicine" is used for five grades classification method, it divided the toxicity of traditional Chinese medicine size into highly toxic, toxic, toxic, small toxic and slightly toxic. "Chinese Pharmacopoeia" and in university textbook "pharmacy" for toxicity and grading standards consistent, those are divided into "big poison", "toxic", "little poison" three criteria.

Determined and Formation of Toxicant

"Poison" invasion of the body will show the related symptoms. Recently, clinically identified "poison", which is mostly based on judgments from clinical symptoms and objective external performance such as toxic evil invasion of human body caused

by the symptoms of many partial red, swelling, heat, pain and other characteristics [2]. The most commonly used method is the reference classification method of Traditional Chinese Medicine toxicity, which is the median lethal dose (LD50) classification method, which is to determine the presence or absence of drug toxicity and toxicity of quantitative indicators. Poison is for what? What is the connotation of poison? Currently, most of poison is a (class) or more (class) pathogenic substances. It is similar to modern medicine said toxins or poisons like materiality. Because of poison into the body, which produce toxic effects and cause illness or death called poisoning. How toxic is by students? The poison is formed, namely the poison is directly derived from the nature. as the name suggests, it is a kind of poison from the outside of the body, such as the plague virus, epidemic toxin, miasma, malaria virus, worm virus etc. Endotoxin is endogenous poison by definition, which is derived from the body. It is a bad product being damaged, organs dysfunction or disorder, decreased metabolism, disorder or disorders, body detoxification system functions appear a sign of disorder [4].

The History Evolution and The Concept of Detoxification

Continuing to struggle with the poison in the human history, people have been looking forward to continuing to explore a variety of anti-drug detoxification method. The understanding and application of detoxification drug have also been an evolving process. Detoxification refers to the lifting of the body or the surface of the toxin as treatment of academic language. Traditional Chinese medicine has accumulated rich experience in the rescue and prevention of poisoning. Detoxification refers to the lifting of toxic heat, cold virus, immunotoxin, Gudu, poisoning caused by damp, burning, poisoning food and poisoning law. Before the Ming and Qing Dynasties, our ancestors were looking for all kinds of detoxification drugs from the living practice. "Shen Nong's herbal classic" mentioned: "Shen Nong tasted hundred of herbs, day met seventy-two drugs and got tea and was the solution." Records of Ming Dynasty "Puji side, Chinese medicine poison": "the ignorant occasionally take, when investigating, its toxicity to business rule.....Licorice can Jie a hundred drug poison, it's wonderful." The West had also exploration of drug detoxification, Pontus kings was a variety of poison mixed together in order to gain the ability to fight all kinds of poison "universal antidote" dating back to first Century BC. Roman physician Galen turned to 70 kinds of ingredients, which would be prepared by mixing more poison antidotes as practice continued into the Middle Ages [5]. At the beginning of nineteenth Century, the detoxification drug exploration of European appeared great change-activated -charcoal detoxification had become a hot spot and the activated carbon also quickly became the most popular at that time [5]. With the progress of molecular pharmacology and toxicology, poisoning mechanism of gradual deepening, special antidotes some new varieties have come out, such as naloxone, flumazenil, digoxin Fab antibody fragments, etc [5-6]. Clinical drugs for the rescue of acute poisoning are collectively referred to as the antidote. Detoxification drug can avoid some poisoning things happening.

The Research of Detoxification Drug Classification Research

Detoxification drug can be classified to classification from different angles. Broadly speaking antidote can be divided into general antidote and specific antidotes. General detoxification is nonspecific, its effect is poor, but it is more extensive application. Special drug detoxification is the drug, which has only a specific detoxification of one or some kind of poison. The kind of special antidote targeted, has a good detoxifying effect. According to the classification treatment of poisoning: metal detoxification drugs, methemoglobin detoxification drug, cyanide detoxification drugs, drug detoxification of organophosphorus pesticides, organic fluorine pesticide detoxification drugs, drug class antidotes, herbal antidotes and other types of antidotes categories [6-8]. According to the mechanism of the detoxification drug detoxification drug class will describe the from the physical, chemical and physiological detoxification antagonistic detoxification [9].

The producing mechanism of "poison" toxicity

As a feature of a drug, "Poison" or "toxic" concept has a long history in our country, the ancient people have put forward a series of principles and methods of the discipline of Chinese medicine, which has a unique connotation of theory of "medicine". Because there are huge number of potential poisons and the diversity of biological structures and repair process, there are countless ways which can lead to poisoning. The toxic effect caused by many factors including toxic chemical structure and physical and chemical properties, the way and the speed of the poison into the body, the concentration of the poison (dose) and its role in time and individual susceptibility and so on [6].

The action mechanism of detoxification drug [6]

Physical detoxification: it reduces the effects of the poison by adsorption, precipitation and other physical effects. Such as activated carbon take in toxicant; egg white, milk, salt and other heavy metals can be precipitated, and its mucosal protective lubrication. Chemical detoxification: through the chemical reaction, the formation of additional compounds and the toxicity reduces such as weak acid alkali neutralization. Physiological antagonistic detoxification: through antagonism toxic effect on the body's physiological function disorder, aim to reduce or eliminate the toxic effects of poison. Such as atropine antagonism organic phosphate ester alkali sample function caused by a toadstool. Under normal circumstances, detoxification of drugs play a role in detoxification through above 3 paths.

The research of Antidote clinical application

The clinical rescue of acute poisoning with drugs is known as antidote [10]. According to its characteristics, it can be divided into general antidote and specific antidote. The role of the former has no specificity, detoxification efficiency is low, but its widely detoxification is spectrum. While the detoxification of the latter is targeted against the detoxification, that is to a

certain or some kind of poison has specific against detoxification, and higher detoxification efficiency [7].

The application of General detoxification drug

General detoxification of drugs is mainly through the physical and chemical effects. such as adsorption, precipitation, oxidation-reduction, neutralization effect, promote the poison damage, reduce the absorption of poison, accelerate the excretion of toxic substances, so as to exert the function of detoxification. (1) neutralizing agent: poison contacting skin and mucosa can be adhesion in or after oral administration of unabsorbed poison by taking in the way to make the poison of inactivated [11]. (2) Precipitating drug: using a precipitating agent allows precipitation poisons, reduce the absorption and the toxicity. Those can make heavy metal salt precipitation such as the use of milk, egg white, tannic acid and other drugs, which the materia mainly can form a layer of protective film on the surface of gastric mucosa, gastric mucosa by avoiding poison stimulation and can delay the absorption of poison. (3) adsorbents: activated carbon has long been considered to be very safe adsorption antidote. After 30-60 min after the poison into the activated carbon can bind to the toxin of 45% to 60%. Each service into 1g poison should use the 10g activated carbon absorption, its 50 - 100 g dose is usually sufficient to [12]. The clinical treatment of activated carbon is widely used in medicine, other chemical poisoning and poisoning in animals and plants.(4) oxygen therapy: it is used for the detoxification of a specific means to generate high pressure oxygen including mainly carbon monoxide, hydrogen sulfide and other gas poisoning, which plays a role in specific antidote and to be used by nitrite, cyanide poisoning treatment [11]. (5) oxidant: potassium permanganate, hydrogen peroxide can cause oxidation of the alkaloids, cyanide, organic phosphorus pesticide and play a detoxification.

Special antidote

Special detoxification drugs are a type of drug that only have specific detoxication on one or some poison. According to the classification of the types of treatment of poisoning treatment: metal detoxification of drugs, drug detoxification of organophosphorus pesticides, cyanide antidotes, methemoglobin antidotes, organic fluorine pesticide detoxification of drugs, drug antidotes class, other types and categories of antidotes. Its chemical properties and its mechanism of various antidotes are different. Along with the progress of research on toxicology and molecular biology, research of and drug detoxification mechanism, the scope of application, the detoxification drug of using methods continues to expand such as anti-toxin serum, botulinum antitoxin serum, digoxin Fab antibody fragments and other new antidote to be used in clinic, which have been developed antidote into a new stage. I will be a special antidote summarized as follows.

Application of metal poisoning antidote

Currently, Mercapto complexing agent and aminoxyol complexing agent are the most widely used types of metal

poisoning antidote in the present [5]. The earliest application of sulfhydryl complexing agent is dimercaprol, which is mainly used for the treatment of arsenic, mercury, gold poisoning. However, because of toxic larger side effects, it is gradually replaced by a new thiol complexing agent. Subsequently, the successful development of two mercapto ding acid and two mercapto propyl sulfonic acid, it is the convenience for the treatment of mercury and arsenic poisoning. Glutathione can be combined directly with certain poisons, effectively relieving exogenous toxic substances (including drugs) toxicity, which has the detoxification of acrylonitrile, fluoride, carbon monoxide, heavy metals and organic solvent [13].

The glutathione is detoxification for treatment of benzodiazepine class poisoning, not only protect the liver cells function and promote benzodiazepine class of drug metabolism in the liver. Glutathione can also promote the amino acid and fatty acid metabolism, promote estrogen inactivation and reduce hypoalbuminemia [14]. Glutathione plays a very important role in the detoxification metabolism, glutathione glutathione peroxidase (GSHPX) and glutathione transferase - S- peptide (GST) unique substrate, glutathione detoxification function is mainly done by that two enzymes [15]. DMPS sodium is driven drug of choice for mercury, but also is used in the treatment of copper, antimony, chromium, bismuth and other metal poisoning [9]. It can be combined with a variety of metal into a stable and soluble complexes, it is for some metals poisoning. Calcium disodium edetate is now mainly drug treatment of lead poisoning, can be combined with a variety of metal becoming stable and soluble complexes, it is used in some metal poisoning, especially for inorganic lead poisoning effect is good. Calcium disodium edetate lead displacement principle for calcium edetate sodium intravenous injection of human body and lead to form a ring structure of chelate, its high solubility in water, and thus is more easily excreted through the kidneys, so the lead expelling effect is obvious, but because of its nonselective binding, but it easily lead to micro elements in zinc, calcium deficiency or complex syndrome [16]. Calcium disodium edetate is a specific in the treatment of lead poisoning [17]. With two thiol ding erna for the treatment of antimony, lead, mercury, arsenic poisoning and prevention of cadmium, cobalt, nickel poisoning, a drive copper and relieve the symptoms of the effect of hepatolenticular degeneration. Clinical reports dimercapto antimony thiomalate poisoning, lead poisoning, such as detoxification and copper metabolism caused by Wilson's disease, which has a good effect [18]. Penicillamine can form non-toxic compound from the body of copper, but also it can induce liver metallothionein synthesis, promote excretion of copper though not the drug of choice, but the advantage of it is that oral [9].

Application of organic phosphorus poisoning antidote

Atropine as the representative of anticholinergic drugs and the pralidoxime chloride represented oximes cholinesterase agents are main the treatment of organophosphate poisoning has antidotes effects [19]. The early, adequate application of atropine is the key to the success of first aid. Clinically, it is necessary to prevent inadequate dosage, but also prevent the

use of excessive lead poisoning, atropine maintain state is to ensure normal vital signs of life [20]. Atropine cholinesterase agents shall be applied at the same time, atropine rescuing acute organophosphate poisoning is an important drug, some doctors are as soon as possible in pursuit of up atropine drug or lack of experience, often "do less rather excessive." [21]. Resurrection cholinesterase drugs should make cholinesterase resurrection, restoring its role hydrolysis of acetylcholine, but also is in vivo in combination with organic phosphate free, non-toxic phosphorylated form the iodine solubilizing determined from the urine, relieve symptoms such as pralidoxime iodide [11]. The Pralidoxime iodide only has an effect on the formation of phosphorylated cholinesterase soon, but after several hours, phosphorylated cholinesterase has "aging", enzyme activity that is difficult to recover, the poisoning early effect is good and the treatment of chronic poisoning is invalid.

Pralidoxime chloride is by early enough, as appropriate, repeated drug use and is reasonable combination with atropine in the treatment of acute organophosphorus pesticide poisoning and has a good curative effect, quick effect and short half-life [22]. Oximes include single oximes pralidoxime pralidoxime chloride and two oximes double solubilizing, double-complex phosphorus. In 1999, WHO recommended pralidoxime chloride as the preferred oximes drugs, domestic oximes pralidoxime agent originally set up to use the main, its use of pralidoxime chloride in the first place at the current[9]. Cholinesterase agents are recommended for use within 48h, there is a large dose of shock therapy advocated on the amount, but also is repeatedly advocated gives. When re-agent and anticholinergic drugs in combination, should reduce the amount of anticholinergic. In the rescue of organophosphate poisoning, pralidoxime should be actively use drugs, but over a large number of pralidoxime iodide is detrimental, because itself is toxic [23]. Application antidotes improve the safer use of detoxification drug, it is necessary.

The application of the detoxification of cyanide poisoning

Combined use of amyl nitrite, sodium nitrite and sodium thiosulfate, still is the preferred treatment for cyanide poisoning [9]. Methylene blue is used in clinic for the treatment by nitrite, chlorate, quinones, quinone imine, aniline and nitrobenzene by caused cyanide poisoning. Methylene blue is a redox agent, at high concentrations, methylene blue normal hemoglobin is oxidized to methemoglobin, methemoglobin easy due to a combination of CN cyanide form methemoglobin, but after a few minutes they are both dissociation, it is only temporary suppression of cyanide toxicity of the organization [23]. Methylene blue is at high-dose (5-10mg/ kg) applications to its role in the effective application of the oxidation treatment of cyanide poisoning, but it is not easy to control the dose, so the clinical application of methylene prison treatment of cyanide poisoning is with caution [11].

The application of methemoglobinemia antidote

Aromatic amino, nitro compound and nitrite compounds poisoning can cause the increase of high-speed rail hemoglobin

content in blood, methylene blue (also known as methylene blue) is a specific antidote such poisoning and should use small dose in clinical application (1~2mg/kg), large quantity of antidotes will increase the poisoning symptoms [24]. Vitamin C is involved in detoxification in the body redox reactions, it is the body of important anti-drug substances [25-26]. Toluidine blue is reduction of methemoglobin faster rate than methylene blue, it has also applications in clinical detoxification.

The organic fluorine poisoning antidote

Our common fluorinated rodenticides have fluoroacetamide, sodium fluoride, fluorine Gan, which affect the citric acid cycle and lead poisoning. Acetamide and ethanol are drug rescue the poisoning of curative effect. Acetamide is a specific antidote by early enough to give acetamide, which is the key to treatment of acute poisoning of fluoroacetamide [27].

The antidote of Common chemicals acute poisoning

Benzodiazepine poisoning antidote

Benzodiazepines are a class of drugs commonly used in clinical sedative-hypnotics, which are commonly used drugs like diazepam, nitrazepam, flurazepam, clonazepam, estazolam [28]. Stability of medicines for benzodiazepines class representative drugs, poisoning is the most stable low-dose oral sedative and hypnotic effects, if oral overdose can cause acute poisoning or even death [28]. Flumazenil is specific benzodiazepine receptor antagonist, competitively blocking the benzodiazepine receptor antagonistic effect of its central nervous system, it can quickly reverse the sedative and hypnotic effects [29]. Flumazenil has specific detoxification for benzodiazepine class of poisoning [30]. Flumazenil is a specific antidote for the treatment of acute diazepam poisoning, can be naloxone combined with significantly shorter recovery time of patients and reduce the complications, it is recommended for clinical use [31]. Flumazenil is in treatment of acute benzodiazepine poisoned class and reverse symptoms, it has with obvious efficacy, stability, no serious adverse reactions [32].

The antidote of acetaminophen poisoning

Acetaminophen is paracetamol, which is currently used for non prescription drugs of antipyretic analgesic [33]. With the widely application, there is also occurred on overdose or poisoning from time to time. Paracetamol mainly cause liver damage and prolonged or excessive use can cause necrosis of liver cells. It is reports that in England many hospital find that the drug is the main reason leading to acute liver failure [34]. However, excessive use and abuse of the drug induced adverse reactions and severe hepatotoxicity and nephrotoxicity has increasingly aroused people's attention [35]. Liver damage to liver failure is the great main adverse drug reactions [36]. The usual dose of acetaminophen is that (2g/d if more than 4g/d can cause liver damage, greater than 10g/d can cause death) [35]. The N-Acetylcysteine containing active thiol is commonly used in detoxification treatment of acute acetaminophen

poisoning [37]. In recent years, it found that N-acetylcysteine has protective effect on liver and used in the treatment of liver toxicity injury induced by acetaminophen poisoning. Acetylcysteine is the treatment of specific antidote acetaminophen poisoning, after 3d, liver function is only mildly abnormal, liver function is normal after a week [38]. Thiol can be with many toxic substances, especially heavy metals (such as lead, mercury, cadmium) react directly combined with toxic substances in the intestines of body, it is the first line of defense of the body against many toxic substances, the sulfhydryl play a detoxification role system directly by hepatic microsomal P-450 enzymes [39]. In recent years, it found that N-acetylcysteine has powerful antioxidant effects and also by inhibiting NF- κ B reducing inflammation, other studies have shown that the pathogenesis of toxic is relevant with free radicals, lipid peroxidation and inflammation [40].

Other antidote

Clinically, alcohol is help to act as an antidote methanol poisoning, can also save fluoroacetamide and sodium fluoroacetate poisoning [9]. The unithiol sodium has been widely used in treatment many types of metal and heavy metal poisoning [41]. Deferoxamine iron is complexing agent, whose early research of the neuroprotective effect, it is considered that remove excess free iron, inhibit the formation of hydroxyl radicals and reduce peroxidation injury, which is used as an antidote to iron poisoning [42]. Opioid analgesic poisoning: naloxone is an opioid receptor antagonist for the antagonistic inhibition of the respiratory center, it has a positive effect with naloxone 0.4~1.2mg by intramuscular or intravenous injection [43]. Naloxone can be used as the drug of choice in rescuing acute alcohol poisoning [44]. Naloxone can also be used for the treatment in opioid dependence poisoning [44]. In recent years, it is reported 10 cases of poisoning with acute naloxone opioid by rapid and repeated intravenous naloxone treatment, whose of 10 patients are cured [45]. Severe cardiac glycoside poisoning, atropine and lidocaine in the treatment of invalid, digoxin specific is antibodies rapidly after injection with digitalis binding and alleviate the symptoms [43]. The β -blockers poisoning: in these drugs, propranolol is the most widely used. When used as atropine and isoproterenol does not work, use of intravenous hyperglycemia is 3~5mg by repeat dosing, it can improve their symptoms [43].

Snakes antidote

The main toxic components can be divided into neurotoxic venom, muscle and blood circulation of botulinum toxin three categories, the latter including cardiac toxicity, clotting drugs and other hemolytic. In order to develop an effective snake medicine, since 1976, establishing the "Guangxi Sheyao Collaborative Group", it will be collected over the years of civil Sheyao screened by animal experiments, which is distribution of "Guangxi snake medicine" to cure snake, the treatment of snake, bees and other insects, amusement clam injury, it has received good curative effect [46]. Venom poisoning is an acute, complex clinical syndrome critical, which is early rational use of anti-venom serum [47]. Treatment for venom detoxification

and snake wound, in addition to specific antivenom, some chemical substances including herbs, ingredients in animal body and chemicals through the different mode of action, it has also a detoxifying effect with different degrees of snake venom, some of whose have also been applied to clinic [48]. A snake bite wound immediately after the discharge liquid, prevent endotoxin venom absorbing into blood, timely injection of antiserum, which was the most effective of first-aid measures [49]. Dragon snake medicine is an effective drug for the treatment of snakebites in clinical. Animal experiments have shown that anti-cobra venom, the role of five steps venom, snake venom and venom of king cobra venom etc. [50]. Experimental studies have shown that when cobra venom with different degrees of polymerization persimmon tannin in different mass ratio, with the increase of the content of tannin, the venom phospholipase A2, acetylcholinesterase, L- amino acid oxidase activity have been a great degree of inhibition and showed a clear dose-response relationship, while suppressing the poisoning effect with increasing degree of polymerization of tannins enhanced [51].

Common herbal detoxification research

Poisoning attention is not only in modern medicine, but also in traditional Chinese medicine in our rescuing and prevention aspects of poisoning, it has accumulated a great deal wealth of experience. Detoxification of drugs are commonly used in traditional Chinese medicine such as the licorice, mung bean, garlic, ginger, pinellia tuber, Scutellaria baicalensis Georgi, lobelia, etc. In traditional Chinese medicine works, due to the historical condition, the pharmacological research on Chinese medicine pharmaceutical mechanism of detoxification of drugs are very limited, only from the angle of traditional medicine "four natures and five flavors" and drug "bias" describe drug detoxification, but those do not affect the history of traditional Chinese medicine in the treatment of antidote for poisoning patients, it plays the role of indelible life in saving health. The author is mainly elaborated the following of licorice root, garlic, ginger, pinellia tuber, Chinese lobelia, Xingnaojing injection and other traditional Chinese medicine detoxification medicines.

Licorice detoxification

Licorice can jie one hundred of drugs toxicity. Licorice and a variety of formulations for multiple drug intoxication, animal poisoning, bacterial toxin and its metabolites in the body poisoning, there is a certain detoxification, which can relieve symptoms and reduce mortality [52-53]. Licorice detoxification began from "Shen Nong's herbal classic", it is called "times to undertake strength, swelling, detoxification." Liquorice in the prevention of drug poisoning has wider application, modern Chinese medicine prescription is inseparable from licorice, it is said "ten prescription to nine grass." " Ben Cao Meng Quan" said that with licorice and black beans cook for drinking juice, treatment of food and arsenic poisoning; almond decoction treatment of lead poisoning; licorice decoction mixed with talcum powder blunt, treatment of reusing organophosphorus pesticide poisoning,

etc. Licorice can solve food poisoning [54], it is reported that fresh mountain lychee, burning duck poisoning each 197 cases and 700 cases, the two are poisoned with rescuing licorice decoction, which turns the corner of all the results. Glycyrrhizic acid is on tetrodotoxin, venom detoxification, glycyrrhizic acid can also relieve effect of diphtheria, tetanus toxin poisoning, licorice with camptothecin treatment of tumor can reduce toxicity and increase curative effect, toxicity of glycyrrhizic acid calcium has obvious detoxication for arsenic and mercury and benzene of streptomycin [55]. Licorice single herb has obvious detoxication, raw licorice and tablets with fried can make the latter reduced toxicity and can significantly reduce the toxicity and mortality of strychnine; licorice can play a strong confrontation with chloral hydrate, physostigmine, acetylcholine induced toxicity test; primary culture of rat liver cells in four oxidation carbon, the licorice can reduce cytotoxicity of CCl4 induced by acid and glycyrrhetic acid [55]. The synergistic effect of detoxification: Glycyrrhizic acid could be hydrolyzed into 1: 2 of glycyrrhetic acid and glucuronic acid in vivo, glycyrrhetic acid is with cortical hormone like effect, can increase the liver detoxification and metabolic effects of the toxin [56]. Easing the toxicity of the drugs by reconciling common the role of licorice in the clinical [57]. It was observed that the licorice and a control group of intraperitoneal injection of strychnine, scopolamine and other 12 kinds of drugs mortality normal mice, the symptoms, the time of death, the experimental results showed that: licorice group lethal drugs are in general rate, time of death, symptoms is low [58]. Licorice detoxification is including detoxification efficiency, easing the effects of the medicine, correcting drug odor, synergistic anticancer effects, etc [59]. Glycyrrhizin detoxification may be through the decomposition of glucuronic acid and poison containing hydroxyl or carboxyl binding and implementation [60]. Licorice is Jie one hundred of drug toxicity. It is known as the old country, ease Jun illness drug and avoid adverse reactions, which plays a role in the treatment of the drug itself [61]. Preventive oral administration of glycyrrhizin can partially alleviate oral platycodin causing by poisoning and death [62]. Licorice decoction in treatment of tallow tree, mountain lychee and unclean meat poisoning have received satisfactory results, licorice decoction made with a single flavor effect, it is first aid and more clinical significance [63]. "Shen Nong's Herbal Classic", "Bie Lu," "Ben Cao Jing Shu" recorded that licorice is "detoxification", "cabernet drug toxicity" and "solution of all vegetation, insects, fish stone animal poisoning" [63]. Ganlvjiedu decoction is on renal protective effect of honey in poisoning rat, with the most obvious effect on kidney protection, it is protective effects on the liver not stronger than dexamethasone [64].

Garlic detoxification

The chemical composition of garlic is complex with rich in vitamins, amino acids, proteins, carbohydrates, inorganic salts and other nutrients. Garlic and its products have a detoxifying effect on rats with lead poisoning, it has useful clinical treatment of lead poisoning patients with garlic, garlic oil is also lead detoxification good for vegetarian animals [65]. Pretreatment is with garlic sub-chronic alcohol intaking induced

liver toxicity antagonism, it has good antioxidant effect on an important mechanism of garlic antagonistic sub-chronic liver damage caused by alcohol consumption, which including glutathione detoxification system has an important role significance [66]. The experimental results show that garlic can block the aminopyrine, sodium nitrite formation on dimethyl nitrosamine in rats, it has been caused by its significant preventive effect [67]. It has reported that oral administration of garlic to lead workers at home and abroad for the treatment of chronic lead poisoning, it has a good effect [68]. Pharmacopoeia of the famous "Compendium of Materia Medical" a detailed description of garlic detoxification, anti-inflammatory effect, modern medical research has proved that garlic and garlic preparations have a good natural disease prevention efficacy [69]. After feeding garlic oil, it promotes a significant increase in lead poisoning rabbits urination, fecal lead content. Garlic is the brain lead better displacement agent, it may serve as a good drug poisoning encephalopathy, garlic oil is ideal for the treatment of drug poisoning [70].

The detoxification effect of ginger

Ginger has many "detoxification" recorded in Materia Medical Works through the ages, it can be used for much poisoning. Ginger can solve the fish and crab poison for using alone or with basil with. In addition, ginger can be solution of pinellia tuber, Arisaema poison with Jiantang beverage service, which can be used for Pinellia, Arisaema poisoning caused by throat dumb, swelling of the tongue numbness, So concocted Breit, Southern Star with the same system using ginger to deduct their toxicity [71]. Liang. Tao Hongjing "Annotations of Materia Medical" recorded "Pinellia toxic with ginger, dried ginger and cook for the solution, In traditional Chinese medicine theory, it is considered that "Pinellia is fear with ginger, use it to produce their poison in power synergetic, it works effectively." [72]. Clinical use of toxic drugs can be with reasonable compatibility ginger, which on the one hand the toxic drugs play a "fire with fire, with partial correction", on the other hand it is restricted its terrible side effects, plays a good attenuated synergistic effect [73]. Ginger can significantly inhibit the growth and inflammation caused by raw Pinellia foot animal tissue PGE2 levels of capillary permeability, reduce the inflammation degree of foot swelling, reduce the content of pinellia tuber animal induced by antagonistic PGE2 content of gastric juice, protect the gastric mucosa, it is suggesting that ginger has a antagonism of Pinellia toxicity detoxification effect in vivo [74]. Studying gradually modern about ginger detoxification to Rhizome Pinelliae at domestic and foreign, now think of pinellia tuber and ginger with fried, which can obviously reduce the spicy ginger pinellia, so that it can reduce toxicity of Rhizome Pinelliae [75].

Mung beans detoxification

Green bean, the classic of traditional Chinese medicine thinks that it is the utilizable water swelling and heat detoxification. Green beans are rich in protein, tannin and flavonoids with organophosphate pesticides, mercury, arsenic, lead compounds

combining to form a precipitate, so that reduction or loss of toxicity is not easily absorbed by the gastrointestinal tract [76]. Green beans are with a strong detoxifying effect and can remove a variety of toxicants in vivo to prevent food poisoning and drug intoxication, which is related with rich protein, dietary fiber and polyphenols and other detoxifying ingredients [77]. Experimental studies have shown that mung bean extract can promote the accumulation of lead discharge and reduce lead [77]. Experimental study is on adsorption of arsenic adsorption curve of mung bean mung on bean powder established under the room temperature condition, establishes the mathematical expression between adsorption and concentration (adsorption model), the mung bean solution arsenic toxicity has carried on the preliminary discussion on theory, by the experimental research, mechanism of mung bean detoxification may be based on physical adsorption [78]. Mung bean detoxification decoction for the treatment of organophosphorus pesticide poisoning is good curative effect with higher safety [79]. Green beans for heavy metals, pesticide poisoning and various other food poisoning, which have better detoxification, experimental studies have shown that green beans can reduce blood lead levels in mice lead poisoning caused by zinc ease original Ye Lin (zPP) l high, reduce the toxic effects of lead, on the body's detoxifying mechanisms for green beans, some people think that may be rich in protein, the tannin and flavonoids relevant [80].

Lobelia detoxification

Lobelia has the efficacy of diuresis detumescence and detoxification, it is commonly used in the treatment of abscesses, insect biting, edema, jaundice, eczema, wet sores, etc [81]. Scutellaria barbata solution effect of snake venom: Lobelia preparation and separation of succinic acid from sodium, sodium fumarate, p-hydroxybenzoic acid sodium respectively in half an hour before the injection of venom oral or subcutaneous injection at the same time, or with succinic acid Na, sodium fumarate and p-hydroxybenzoic acid sodium compound oral composition are in 4 hours before the injection of venom 0.5~4h, for the protective effect of injection of minimum lethal dose of cobra venom in mice is higher, the protection rate is to 59.1~93.1% [82]. Lobelia is with strong and diuresis and diarrhea lasting effect below, which is of great benefit to accelerate the venom efflux.

Xingnaojing detoxification function

Xingnaojing has Qingreliangxue, detoxification, relieving pain and other effects in recent years, it is widely used in clinical. Acute alcohol poisoning [83]: Alcoholism is related to central opioid system activation, excessive consumption of alcohol is with the plasma beta endorphin increasing, it combines with morphine receptor through the determination of plasma beta endorphin, oxygen free radicals, superoxide dismutase changed, it is discovered that Xingnaojing has pharmacological effect of naloxone and accept same and opioid receptor antagonist, is a powerful antioxidant and its obvious analeptic effects can be used for the treatment of alcoholism. Xingnaojing injection is the drug safety and effective treatment of atropine poisoning [83]. In recent years, it has been widely used in clinically,

whose mechanism of action is mainly in the following areas [84]: (1) Bidirectional regulation effect on central nervous system; (2) removing of oxygen free radicals and anti-oxidation; (3) stimulation of the respiratory center, improve blood pressure, improve ventilation; (4) improve vascular permeability, enhancement of cerebral blood flow, protect neurons; (5) improving endothelial dysfunction, prevent thrombosis and improve coronary circulation. Therefore, Xingnaojing injection is for first-aid ill patients critically with significant effect, the popularization and application of essential drugs can be used as rescuing emergency poisoning. Acute CO poisoning [85]: Someone using Xingnaojing combined with naloxone in treatment of acute CO poisoning. The result of the treatment group is with 30 patients curing 19 cases, effective 8 cases, invalid 3 cases, the total efficiency is of 90%; control group of 30 cases and 10 cases are cured, effective 10 cases, invalid 10 cases, the total efficiency rate is of 67%, the difference between two groups are statistically significant ($P < 0.05$). Research has shown that, it is poisoning effect better than conventional western medicine routine + Xingnaojing injection in treatment of acute alcohol. In the conventional treatment under the same condition, XNJI has the similar effect with naloxone [86].

Scutellaria detoxification

There are Mainly Qingre dampness, Xiehuo detoxification effect with Baikal Skullcap. Common prescriptions from surgery science skullcap as the main component for the treatment of skin sores, such as Huanglian Jiedu decoction, bezoar detoxification pills, its effect is sure [87]. Curing poison and metabolic poison: the experiment result shows that the active components of skullcap can alleviate liver injury caused by carbon tetrachloride [88] and are with the role of antioxidant [89]. Scutellaria baicalensis Georgi has obvious antioxidant effect, can inhibit the generation of lipid peroxidation induced by acetaminophen and carbon tetrachloride liver lipid peroxidation injury, it has a protective effect [90]. Experimental studies have shown that skullcap and skullcap of various active ingredients inhibit the growth of cancer cells [91]. Baicalin inhibits a variety of viruses in recent years, the studies r are the most popular anti human immunodeficiency virus of baicalin (HIV) function, can induce apoptosis of the cells infected with HIV [92].

Epilogue and Conclusion

Generally, Antidote is commonly used in clinical therapy, timely and reasonable enough using antidote can accelerate excretion of toxic substances, protected the body and reduce complications. Application of antidote should understand the mechanisms of drug action, master the use of dose, good drug indications, insufficient to prevent the antidote or excessive, pay close attention to its toxic side effects and carry out symptomatic treatment in time. This will play a special role in the detoxification of the antidote and also minimize the antidote secondary damage for poisoning patients caused. The role of antidotes are splitted in two, detoxifying drug are to be used as soon as possible, antidote has not only its special

role in the side, but also has its limitations, so its clinical application is limited. Antidotes tend to have certain side effects and toxicity, especially in the case of excessive using are prone to. Over-reliance on existing drug detoxification, drug detoxification relativity effect have been ignored, and showed a clear understanding of its adverse phenomenon in practical applications, hence giving rise to cases of detoxification of poisoning increasing gradually. The adverse reactions are of unclear understanding phenomenon, resulting in the detoxification drug poisoning cases are increasing. Modern treatment of acute poisoning antidotes are as good aids and scientific and rational application can shorten the course of treatment of patients, save lives and health of the patients, which can lighten the financial burden of the national.

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