Application Frequency Research on Insomnia Correlated Treatment of Chinese Herbs

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Abstract

Objective: To study common Chinese herbs related to treatment of insomnia and their efficacy classification, providing references for their applications in treating insomnia.

Methods: By using information quantitative statistics method, 8176778 literatures in CNKI China Academic Journal Network Publishing Database (CAJD), Medical and Health Science and Technology Database were retrieved from 1996 to 2016. Full-text retrieval was performed by taking insomnia as “key word”. Totally 500 commonly used herbs with higher application frequency were retrieved as “key word” twice. Their application frequencies were statistically calculated. Then they were classified and analyzed by effectiveness in Chinese Materia Medica according to statistical results.

Results: Herbs for insomnia related treatment with higher application frequency were sequenced from high to low as licorice root (56183 times), Chinese Angelica (54817), Astragalus Atractyloides (45964), Salvia Miltiorrhiza (45959), Radix Bupleuri (44034), Radix Paeoniae alba (39525), Astragalus membranaceus (39370), Tuckahoe (37319), pinellia (36268), Danshen (35292), and so on. Recipes consisted of them were Suanzao Ren Decoction, Jiaotai Pill, Guipi Decoction and so on. According to effectiveness in Chinese Materia Medica, Chinese herbs with higher application frequency after comprehensive analysis were deficiency supplementing herbs, heat clearing herbs, activating blood circulation and removing blood stasis herbs, qi regulating herbs, sedative herbs, and so on.

Conclusion: Deficiency supplementing herbs, heat clearing herbs, activating blood circulation and removing blood stasis herbs, qi regulating herbs, sedative herbs were commonly used Chinese herbs for treatment of insomnia.

Keywords: Insomnia; Chinese Herbal Treatment; Correlation; Information Quantitative Statistics

Introduction

Insomnia is the most common sleep disorder, is a very common complaint of patients in various clinical departments, belongs to the category of “insomnia” in traditional Chinese medicine, Huangdi’s Classic known as “insomnia”, “cannot sleep”, “cannot lie down”, for a variety of reasons lead to insomnia caused by distracted sleep disorders. Chinese medicine is currently one of the most commonly used methods to treat the disease [1-3]. In order to objectively evaluate the commonly used Chinese medicines and their categories in the treatment of insomnia, this study used quantitative statistics to analyze the frequency of modern application of Chinese medicines related to insomnia and classified them according to the efficacy of Chinese Materia Medica. The results are reported below.

Data and Methods

Data Source

With insomnia and 500 kinds of commonly used Chinese medicines as keywords, 8176778 articles were accurately retrieved from China How Net, China Academic Journal Network Publishing General Library and Medical and Health Science and Technology Database from 1996 to 2016. The retrieval methods are as follows: firstly, insomnia is used as the search term, and then 500 kinds of commonly used Chinese medicines are used as the search term for the second time. At the same time, the documents detected in the two searches are analyzed according to the following criteria, and the number of articles that meet the inclusion criteria are recorded, counted and sorted respectively.

Literature Inclusion and Exclusion Criteria

Inclusion criteria: literature on clinical (clinical research, clinical trials, clinical observations, clinical reports, clinical experience, etc.) and experimental (pharmacodynamic experiments, pharmacokinetic experiments, etc.); exclusion criteria: items, indexes and review of analytical literature.

Statistical Ranking Method

The number of articles in each Chinese medicine which were retrieved twice and met the inclusion criteria was recorded before
the name of the Chinese medicine (one paragraph for each drug name, the number of articles recorded was based on 5 digits, and those Less than 5 digits make up 5 figures with 0 before figures), such as “06710 magnet”. Automatic ranking of paragraphs according to numbers in Word documents.

**Classification Study**

After searching, 500 kinds of traditional Chinese medicines were arranged in descending order. Only the first 200 kinds were classified according to the efficacy of Chinese Materia Medica. The total frequency and average frequency of the first and second classifications were listed respectively.

**Result**

Frequency of application of Chinese medicines for insomnia (Table 1). The first 50 medicines included Suanzaoren Decoction (Suanzaoren, Ligusticum chuanxiong, Anemarrhenae, Poria cocos, Licorice), Guipi Decoction (Atractylodes macrocephala, Ginseng, Astragalus, Angelica sinensis, Licorice, Fu Ling, Polygala, Suanzaoren, Muxiang, Longan, Ginger, Dazao), Jiaotai pill (Coptis chinensis, Cinnamomum cassia) Commonly used prescriptions for insomnia.

**Table 1:** Table of application frequency of insomnia related Chinese Medicine.

| Name/Frequency | Name/Frequency | Name/Frequency | Name/Frequency | Name/Frequency |
|----------------|----------------|----------------|----------------|----------------|
| Licorice 56183 | Ligustrum lucidum 17190 | Malt 09785 | Leech 05952 | Glehnia littoralis 04036 |
| Chines Angelica | Gardenia 17172 | Mother-of-pearl 09776 | Cistanche 05862 | Glauber's salt 04026 |
| Atractyloides 45964 | Chrysanthemum 16351 | Sophora flavescens 09755 | Papaya 05850 | Semen Raphani 04008 |
| Mittiorrhiza 45959 | Costusroot 16328 | Psoralen 09681 | Polygonum cuspidatum 05745 | Radix Isatidis 03885 |
| Bupleurum root 44034 | Rynchophylla 16136 | Cohosh 09464 | Cinnabar 05653 | Prunella Vulgaris 03880 |
| Paonia lactiflora 3925 | Eucommia 15804 | Trichosanthes 09464 | Angelica 05618 | Hempseed 03804 |
| Astragalus membranaceus 39370 | Magnolia officinalis 15634 | Coix seed 09135 | Bornerea 05388 | Gorgon fruit 03792 |
| Poria cocos 37319 | Panax notoginseng 15630 | Bombax 09118 | Soviet wood 05244 | Rhizoma Smilacis Glabrae 03727 |
| Pinelliaternata 36268 | Figwort 15581 | Honeysuckle 08928 | Fructus Triticus Levis 05235 | Reddle 03660 |
| Codonopsis pilosula 35292 | Radix rehmanniae 15331 | Radix Gentianae 08910 | Mustard seed 05190 | Perilla frutescens crispa 03638 |
| Dried tangerine peel 31533 | Atractylodes lancea 15221 | Rhizoma sparganii 08874 | Pangolin 05182 | Pilose antler 03551 |
| Coptis chinensis 31394 | Donkey-hide gelatin 15151 | Herba Epimedii 08857 | Cassia seed 05181 | Perillaseed 03478 |
| Fingered citron 28970 | Lilium brownii 15107 | Morinda officinalis 08777 | Excrementum pteropi 05175 | Musk 03473 |
| Flos Carthami 28490 | The fruit of Chinese wolfberry 14460 | Oriental wormwood 08633 | American ginseng 05156 | Fructus viticis 03402 |
| Ligusticum wallichii 28416 | Fructus amomi 13674 | Scorpio 08532 | Mulberry leaves 05144 | Round cantaloum 03387 |
| Yam 28072 | Radix Pseudostellariae 13380 | Concha haliotidis 08009 | Hermapathchou 05137 | Cannon ginger 03212 |
| Radix Ophiopogonis 27945 | Dried ginger 13371 | Plaster 07887 | Rhizoma imperatae 04990 | Lulu Tong 03200 |
| Ginseng 27844 | Pberetima 13155 | Endothelium Corneum gigeriae galli 07834 | Mulberry bark 04989 | Cockroach 03184 |
|----------------|----------------|------------------------------------------|---------------------|----------------|
| Peach kernel 26869 | Cortex Moutan 12238 | Semen nelumbinis 07792 | Centipede 04967 | Fructus rubi 03170 |
| Radix Paeoniae 26696 | lignum millettiae 12061 | Turtle shell 07790 | Pritillaria thunbergii 04883 | Tripterygium wilfordii 03166 |
| Semen zizyphi spinosae 25914 | Ephdra sinica Stapf 12004 | Cortex lycii radicis 07756 | Hairyevein agrimony 04863 | Monkshood 03131 |
| Tulip 25794 | Bambusae caulis im taeniam 11870 | Pericarp 07473 | Talc 04826 | Ramulus mori 03121 |
| Schisandra chinensis 25331 | Platycodon grandiflorum 11749 | Cassia twig 07349 | Bezoar 04688 | Inula 03108 |
| Radix achyranthis bidentatae 24023 | Fructus aurantii Immaturus 11725 | Medicated leaven 07318 | Alizara 04668 | Fructus Cnidium 03028 |
| Rheum officinale 23594 | Semen corni 11715 | Herba Hedysots 07300 | Radix clandestis 04637 | Rhizoma cibotii 02992 |
| Rhizoma alismatis 22142 | Yellow semen 11672 | Curculum zedoary 07084 | Herba eupatori 04634 | Kelp 02970 |
| Monkshood 21884 | Motherwort 11607 | Myrrh 06718 | Houttuynia cordata 04580 | Fructus rosae haevigatea 02962 |
| Polygala root 21780 | Forsythia suspense 11519 | Magnetite 06710 | Sanguisorba officinalis 04574 | Testa mungo 02961 |
| Baikal Skulkap 21564 | Acorus calamus 11517 | Pollen cattail 06672 | Grifola 04548 | Arteannuin 02957 |
| Rhizoma Cyperi 21491 | Polygonum multiflorum 11330 | Fructus meliae toosendan 06669 | Cicada slough 04547 | Cortex dictam 02915 |
| Anemarrhena 21105 | Cortex albizziae 11035 | Asparagus 06618 | Seaweed 04514 | Fructus kochiae 02881 |
| Fossil fragments 19317 | Semen boitae 10989 | Frankincense 06597 | Honey 04497 | Eclipta 02738 |
| Phellodendron 18948 | Plantago seed 10863 | Jade bamboo 06519 | Radix lithosperm 04449 | Cornu bubali 02737 |
| Fructus Ziziphi Jujubae 18907 | Corydalis ambigua Ch. 10672 | Radix dipsaci 06471 | Allii maccstemi bulbus 04402 | Dragon’s blood 02729 |
| Ginger 18505 | Dodder 10425 | Dark plum 06423 | Aloe 04336 | Cornu antelopis 02720 |
| Cinnamon 18299 | Parasitic loranthus 10404 | Dendrobium 06340 | Amber 04231 | Angelica decursiva 02657 |
| Pueraria lobata 17847 | Hawthorn 10212 | Evodia 06277 | Clove 04217 | Desmodium 02639 |
| Oysters 17435 | Mint 10206 | Higenamine 06266 | Artemisia 04084 | Cordyceps sinensis 02614 |
| Rehmannia glutinosa 17273 | Semen anomi amari 10200 | Turmeric 06080 | Placenta Hominis 04084 | Bletilla striata 02609 |
| Gastrodin 17195 | Dandelion 09848 | Lentil 06068 | Patrinia 04054 | Tabaschir 02537 |
The top 200 kinds of Chinese medicine related to insomnia were classified according to the results of Chinese Materia Medica (Table 2). According to the first-class efficacy classification, the top five frequencies were Tonic medicines (623628), Antipyretic (295220), Huoxue Huayu (271535), Relieving drug (152639) and Liqi (139183). According to the first-class efficacy classification, the average frequency of the top five were tonifying deficiency (164111), promoting blood circulation and removing blood stasis (142914), regulating qi (132032), calming the mind (127810), and Wenli (12810). According to the classification of secondary efficacy, the top five frequencies were Reinforcing Qi (280733 times), reinforcing blood (150614 times), activating blood circulation and regulating menstruation (149009 times), regulating qi (139183 times) and dissipating wind-heat (111143 times). According to the second-level classification, the average frequency of the top five were Reinforcing Qi (255211 times), reinforcing blood (25102 times), activating blood circulation and regulating menstruation (24835 times), clearing away heat and drying dampness (18118 times) and astringent intestines to stop diarrhea (15877 times).

Table 2: Efficacy classification of insomnia related Chinese medicine application frequency.

| Efficacy                  | Frequency | First class classification |
|---------------------------|-----------|---------------------------|
| First class classification | Secondary classification | Number | Total frequency | Average frequency | Number | Total frequency | Average frequency |
| Relieving exterior syndrome | Dissipate wind-cold | 4 | 41496 | 10374 | 12 | 152639 | 12720 |
| Herbs used to disperse wind-heat | 8 | 111143 | 13893 |
| Heat clearing | Clearing heat-five | 5 | 55225 | 11045 | 28 | 295220 | 10544 |
| Heat clearing and drying | 5 | 90591 | 18118 |
| Clearing away heat and toxic material | 9 | 56802 | 6311 |
| Blood-Cooling | Clearing deficient heat | 2 | 10713 | 5357 |
| Purgation | Severe laxative | 2 | 27620 | 13810 | 3 | 31424 | 10475 |
| Mild laxation | 1 | 3804 | 3804 |
| Dispelling Wind and dampness | Dispel wind and cold dampness | 5 | 22436 | 4487 | 9 | 42119 | 4680 |
| Dispelling wind and humid heat | 4 | 19683 | 4921 |
| Resolving dampness | Resolving dampness | 6 | 57687 | 9615 | 6 | 57687 | 9615 |
| Clearing Damp and Promoting diuresis | Inducing diuresis to alleviate edema | 4 | 73144 | 18286 | 10 | 108731 | 10873 |
| Inducing diuresis treating strangurti-a | 3 | 18570 | 6190 |
| Remove Dampness through diuresis | 3 | 17017 | 5672 |
| Warm the interior | Warm the interior | 5 | 64048 | 12810 | 5 | 64048 | 12810 |
| Category                                      | Action                                      | Frequency | Value 1  | Value 2  | Value 3  | Value 4  | Value 5  |
|----------------------------------------------|---------------------------------------------|-----------|----------|----------|----------|----------|----------|
| Regulate the flow of vital energy and remove obstruction to it | Regulate the flow of vital energy and remove obstruction to it | 10        | 13918    | 13918    | 10       | 13918    | 13918    |
| Help digestion                               | Help digestion                              | 5         | 39157    | 7831     | 5        | 39157    | 7831     |
| Hemostasis                                   | Cooling blood and hemostasis                | 2         | 9564     | 4782     | 10       | 56477    | 5648     |
| Blood stasis and hemostasis                  | Blood stasis and hemostasis                | 4         | 32145    | 8036     |          |          |          |
| Hemostasis with astringents                  | Hemostasis with astringents                | 2         | 7472     | 3736     |          |          |          |
| Warming meridian to stop                     | Warming meridian to stop                   | 2         | 7296     | 3648     |          |          |          |
| Promoting blood circulation for removing blood stasis | Promoting blood circulation to arrest pain | 6         | 84277    | 14046    | 19       | 271535   | 14291    |
| Hemostasis with astringents                  | Hemostasis with astringents                | 2         | 7472     | 3736     |          |          |          |
| Promoting blood circulation to restore menstrual flow | Promoting blood circulation to restore menstrual flow | 6         | 149009   | 24835    |          |          |          |
| Blood activating and healing                 | Blood activating and healing                | 3         | 11157    | 3719     |          |          |          |
| Rupture of blood                             | Rupture of blood                            | 4         | 27092    | 6773     |          |          |          |
| Resolving Phlegm and relieving cough and asthma | Warming cold phlegm                        | 3         | 44566    | 14855    | 12       | 103677   | 8640     |
| Clearing heat and phlegm                     | Clearing heat and phlegm                   | 7         | 50644    | 7235     |          |          |          |
| Relieving cough and asthma                   | Relieving cough and asthma                 | 2         | 8467     | 4234     |          |          |          |
| Relieve uneasiness of mind and body tranquilization | Relieve Uneasiness of Mind and body tranquilization | 8         | 105629   | 13204    | 8        | 105629   | 13204    |
| Calm the liver to stop the wind              | Calm the liver to stop the wind            | 4         | 38880    | 9720     | 12       | 115391   | 9616     |
| Resting wind and spasmodic                   | Resting wind and spasmodic                 | 8         | 76511    | 9564     |          |          |          |
| Inducing resuscitation                       | Inducing resuscitation                     | 3         | 20378    | 6793     | 3        | 20378    | 6793     |
Discussion

Insomnia is a common clinical disease and frequently-occurring disease, but the causes of insomnia are complex, on the one hand, with its own individual psychological factors, physiological factors and genetic factors; on the other hand, with external factors such as environmental factors, physical diseases, mental illness, drug use or abstinence related. The pathophysiological mechanism is unclear; which is related to abnormalities of neurotransmitters, hormones, cytokines and circadian rhythms in the brain. Therefore, there is still a lack of truly safe and effective treatment drugs and methods. Oral sedative and hypnotic drugs such as diazepam are the most common and common treatment for insomnia [4]. However, insomniacs love and hate them because of their dependence, tolerance and addiction, residual sedation during the day and rebound after stopping the drugs. Hong Biqi and other [5-13] reviewed the efficacy and safety of traditional Chinese medicine in the treatment of insomnia.

In order to further understand the classification and application of Chinese medicines related to insomnia, this study used different statistical methods to analyze the first 200 kinds of Chinese medicines according to the efficacy classification of TCM. Firstly, the total frequencies of the first and second classifications of Chinese herbal medicines were counted. The results showed that there was a great correlation between the ranking results and the number of different kinds of Chinese herbal medicines. For example, according to the efficacy classification of TCM, the most frequently used drugs were tonic, heat-clearing, blood-activating and stasis-removing, Qi-Regulating and tranquilizing drugs. The most frequently used drugs were licorice, Angelica sinensis, Atractylodes macrocephala, Salvia miltiorrhiza, Bupleurum root, paeony root, Astragalus membranaceus, Poria cocos, Pinellia ternate and Codonopsis pilosula. According to the efficacy classification of TCM, the most frequently used drugs were tonic, heat-clearing, blood-activating and stasis-removing, Qi-Regulating and tranquilizing drugs. The results of this study reflect to some extent the objective situation of traditional Chinese medicine.

| Supplement deficiency | Tonifying Qi | 11 | 280733 | 25521 | 38 | 623628 | 16411 |
|-----------------------|-------------|----|--------|-------|----|--------|------|
|                       | Tonifying yang | 6  | 150614 | 25102 |
|                       | Tonifyingyin  | 10 | 105955 | 10596 |
| Inducing astringency  | Antidarrhea with astringent | 2  | 31754  | 15877 | 8  | 66420  | 8303  |
|                       | Treating spontaneous emission and leukorrhagia | 5  | 29431  | 5886  |
| Strengthening exterior and reducing sweat | 1 | 5235 | 5235 |
| Detoxicating and destroying parasites | Detoxicating and destroying parasites | 1 | 3028 | 3028 | 1 | 3028 | 3028 |

It needs to be noted that the statistical results of this time are based on the full-text retrieval of the relevant database, cannot analyze the original text of the relevant literature, so inevitably there will be statistical incompleteness, and there will also be a certain drug is not a treatment for insomnia, but due to appear in the literature was statistical phenomenon. Therefore, the results of this study only reflect to some extent the objective situation of traditional Chinese medicine in treating insomnia. In summary, quantitative analysis of information found that the frequency of insomnia-related traditional Chinese medicine was higher than that of licorice, Angelica sinensis, Atractlyodes macrocephala, Salvia miltiorrhiza, Bupleurum root, paeony root, Astragalus membranaceus, Poria cocos, Pinellia ternate and Codonopsis pilosula. According to the efficacy classification of TCM, the most frequently used drugs were tonic, heat-clearing, blood-activating and stasis-removing, Qi-Regulating and tranquilizing drugs. The results of this study reflect to some extent the current clinical application of insomnia-related Chinese medicine, which can be used as a reference for the future use of Chinese medicine in the treatment of insomnia.

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