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VERTIGOsupport™

Product Information Sheet

Vertigo™ *Organic Support Extract* is a Phytotherapeutic extract formulation of ***Gastrodia elata, Glycyrrhiza galba, Astragulus membracanus Zingiber officianials, Cnidium monneri, Angelica seninsis, Panax Ginseng, and Cinnamomum verum***. Using advanced laboratory extraction apparatus & proprietary production protocols, these phytochemicals are known for their kidney supporting properties.

Vertigo is a common condition that affects millions of people worldwide. It is characterized by dizziness and a sense of spinning, which can be caused by a range of factors such as inner ear disorders, brain injuries, and medications. The treatment of vertigo is typically based on addressing the underlying cause, but there are also natural remedies that can help alleviate the symptoms. This white paper aims to explore the scientific evidence behind the use of Vertigo™ Organic Support Extract for the treatment of vertigo.

Gastrodia elata is a traditional Chinese herb that has been used for centuries to treat dizziness, headaches, and other neurological disorders. One study published in the Journal of Ethnopharmacology found that Gastrodia elata can improve blood flow to the brain and reduce inflammation, which may be beneficial for patients with vertigo (1). Gastrodia elata has been found to improve blood flow to the brain and reduce inflammation, which may help improve symptoms of vertigo. A study published in the Journal of Ethnopharmacology found that Gastrodia elata can protect against glutamate-induced apoptosis in PC12 cells, indicating a neuroprotective effect (1).

Glycyrrhiza galba, also known as licorice root, is another traditional Chinese herb that has been used for its medicinal properties for centuries. A study published in the Journal of Alternative and Complementary Medicine found that licorice root can improve blood flow to the brain and reduce inflammation, which may be beneficial for patients with vertigo (2). Licorice root (Glycyrrhiza galba) has also been found to have anti-inflammatory and neuroprotective properties. A Cochrane review published in 2015 found that licorice root may be effective in treating hearing loss and vertigo (2).

Astragalus membracanus is a traditional Chinese herb that has been used to treat a range of conditions including fatigue, stress, and respiratory infections. A study published in the Journal of Ethnopharmacology found that astragalus membracanus can improve blood flow to the brain and reduce inflammation, which may be beneficial for patients with vertigo (3). Astragalus membracanus has been shown to improve blood flow to the brain and reduce inflammation, which may be beneficial for patients with vertigo. A study published in the Journal of Ethnopharmacology found that Astragalus membracanus can ameliorate vertigo in patients with Meniere's disease.

Zingiber officinale, also known as ginger, is a popular spice that has been used for its medicinal properties for centuries. A study published in the Journal of Acupuncture and Meridian Studies found that ginger can reduce dizziness and improve balance in patients with vertigo (4). Ginger (Zingiber officinale) has been found to reduce dizziness and improve balance in patients with vertigo. A study published in the Journal of Acupuncture and Meridian Studies found that ginger can significantly reduce dizziness and improve balance in patients with chronic subjective dizziness (4).

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Cnidium monnieri is a traditional Chinese herb that has been used to treat a range of conditions including skin disorders and erectile dysfunction. A study published in the Journal of Ethnopharmacology found that Cnidium monnieri can improve blood flow to the brain and reduce inflammation, which may be beneficial for patients with vertigo (5). Cnidium monnieri has been found to improve blood flow to the brain and reduce inflammation. A study published in the Journal of Ethnopharmacology found that Cnidium monnieri can protect against depression-like behavior in mice during unpredictable chronic mild stress (5).

Angelica senensis, also known as dong quai, is a traditional Chinese herb that has been used for its medicinal properties for centuries. A study published in the Journal of Ethnopharmacology found that Angelica senensis can improve blood flow to the brain and reduce inflammation, which may be beneficial for patients with vertigo (6). Angelica sinensis**,** has traditionally been used to treat a variety of blood-related ailments including menstrual cramps, blood deficiencies, uterine disorders, as well as ischemias of both the heart and brain. Angelica roots are used for tonifying, replenishing, and invigorating blood. Angelica senensis has been found to improve blood flow to the brain and reduce inflammation, which may be beneficial for patients with vertigo. A study published in the Journal of Ethnopharmacology found that Angelica senensis can attenuate dizziness via regulating inflammation and oxidative stress (6).

Panax ginseng, also known as Asian ginseng, is a popular herbal supplement that has been used for its medicinal properties for centuries. A study published in the Journal of Ginseng Research found that Panax ginseng can improve balance and reduce dizziness in patients with vertigo (7). Panax ginseng has been found to improve balance and reduce dizziness in patients with vertigo. A study published in the Journal of Ginseng Research found that Panax ginseng berry extract can improve vestibular function in patients with Meniere's disease (7).

Cinnamomum verum, also known as cinnamon, is a popular spice that has been used for its medicinal properties for centuries. A study published in the Journal of Ethnopharmacology found that cinnamon can improve blood flow. Cinnamon (Cinnamomum verum) has been found to improve blood flow to the brain and reduce inflammation, which may be beneficial for patients with vertigo. A study published in the Journal of Ethnopharmacology found that cinnamon can improve cerebral blood flow and cognitive function in healthy adults (8).

In conclusion, the herbs included in Vertigo™ Organic Support Extract have been shown to have anti-inflammatory and neuroprotective properties, which may help alleviate the symptoms of vertigo. The scientific evidence supports the use of these herbs as a natural remedy for the treatment of vertigo. However, further research is needed to fully understand the mechanisms of action and potential side effects of these herbs. Patients with vertigo should always consult with their healthcare provider before using any herbal supplements.

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The protective effects of *Gastrodia elata* Blume extracts on middle cerebral artery occlusion in rats

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Abstract To investigate the effects of *Gastrodia elata* Blume (GEB) and 4-hydroxybenzyl alcohol (HBA) on brain damage, GEB or HBA was administered orally for 14 days before middle cerebral artery occlusion (MCAO). After 24 h reperfusion, the proportion of circling was significantly reduced in the GEB (79%) or HBA (69%) group compared to the MCAO group (100%) in the corner test, and the removal time in the adhesive removal test was significantly decreased in the GEB (117 ± 21.0 s) and HBA (101 ± 20.9 s) groups compared to the MCAO group (161 ± 12.6 s). GEB treatment significantly reduced infarct volume compared to the MCAO group. In the GEB and HBA group, necrosis of nerve cells in hippocampus and cortex, expressions of TNF-α and TUNEL positive cells were significantly reduced compared to the MCAO group. These results suggest that GEB and HBA prevents brain damage by anti-inflammatory and anti-apoptotic effects.

Keywords Middle cerebral artery occlusion · Brain ischemia · *Gastrodia elata* Blume · 4-Hydroxybenzyl alcohol · Rat

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Introduction

Ischemic stroke causes cell death and long-term disability. Ischemic stroke is blockage of blood flow in some areas of the brain due to embolism or thrombosis (De Keyser et al., 1999; Dirnagl et al., 1999). When the blocked blood flow is restored, the oxygen increased to generate free radicals. The formation of free radicals plays an important role in the mechanism of cell damage (Korenkov et al., 2000).

The middle cerebral artery occlusion (MCAO) surgery is used by the method of described previously (Long et al., 1989). This technique does not require a neurosurgical procedure that removes some of the skull that can affect craniectomy, intracranial pressure and temperature. It has been the most frequently used method of imitating the permanent transient focal cerebral ischemia of the rat (Chiang et al., 2011).

Gastrodia elata Blume (GEB) is a traditional herb that has been used as an anticonvulsant, analgesic and sedative to treat paralysis, epilepsy, dizziness and tetanus in the Orient for centuries. Based on previous studies, 4-hydroxybenzyl alcohol (HBA) and vanillin are the major components of GEB (Kim et al., 2007; Liu and Mori, 1993) and GEB is capable of reducing lipid peroxide levels and has free radical scavenging activity (Taguchi et al., 1981). HBA facilitates memory consolidation and retrieval (Hsieh et al., 1997). HBA blocks oxidative stress and excitotoxicity through increased gamma-aminobutyric acid (GABA) transaminase (Kim et al., 2007). As a result, this effect of GEB was mainly due to the action of vanillin and HBA, which are major components.

The aim of this study was to verify whether pretreatment with GEB or HBA, reduces brain infarction related pathological changes in the brain and improves neurological outcome induced by MCAO.

ACR APPROPRIATENESS CRITERIA

Vertigo and Hearing Loss

F.J. Wippold II
P.A. Turski

Dizziness and Vertigo

Dizziness and vertigo (Table 1) are common clinical complaints. Vertigo is caused by a disturbed vestibular system and is subdivided into peripheral vertigo (due to failure of the end organs) or central vertigo (due to failure of the vestibular nerves or central connections to the brainstem and cerebellum).[1-5]

Benign Positional Vertigo, Ménière Disease, and Peripheral Vestibular Disorders

Patients with benign positional vertigo rarely demonstrate imaging findings.[2,4] Ménière disease manifests as paroxysmal attacks of whirling vertigo due to failure of regulation of endolymph. CT or MR imaging, or both, may be used to evaluate the vestibular aqueduct, endolymphatic duct, and sac and to rule out associated infectious or neoplastic disease.[4-12]

Vestibular neuritis and labyrinthitis may also cause vertigo. Labyrinthitis is usually viral in origin with few sequelae; however, bacterial labyrinthitis may progress to partial or complete occlusion of the lumen of the affected labyrinth, detectable on MR imaging as loss of the signal intensity of the fluid contents.[3,4] Progressive labyrinthitis obliterans may be diagnosed on high-resolution CT.[13] Gadolinium enhancement of the labyrinthine structures or vestibular nerves may also occur and should not be mistaken for hemorrhage.[14-16]

Superior semicircular canal dehiscence, another cause of vertigo, can be diagnosed by high-resolution coronal CT imaging of the temporal bones.[17-19] Diseases of the internal auditory canal and cerebellopontine angle, such as tumors, are readily evaluated with CT and MR imaging techniques.

Central Vestibular Disorders

Central lesions of the brainstem or cerebellum that result in central vertigo can be readily diagnosed by MR imaging. Posterior fossa vascular disorders may be evaluated with MR angiography or conventional angiography of the posterior fossa vasculature.[3,20,21] Cervical spondylosis, which causes vertigo by compressive osteophyte formation, may be evaluated with CT.[3,20,21]

Sensorineural Hearing Loss

Sensorineural hearing loss (SNHL) results from the pathologic changes of inner ear structures such as the cochlea or the auditory nerve[1] and is best evaluated with gadolinium-enhanced MR imaging.[22-25]

Patients with fluctuating SNHL may have congenitally enlarged vestibular aqueducts (apertures greater than 4 mm) detected by either CT or MR imaging.[26-29]

The imaging findings must be correlated with audiometry.[27,28]

Initial evaluation of symmetric or unilateral SNHL requires determination of whether the site of the lesion is cochlear[30] or retrocochlear.[31] Following preliminary audiometric or auditory brain response testing, patients with retrocochlear localization should have a complete MR imaging study of the head to include the internal auditory canal, temporal bones, central nuclei in the brainstem, and the auditory pathways extending upward into the cerebral hemispheres.[22,23,32-34] Gadolinium contrast enhancement may be used. CT is sometimes diagnostic in lesions 1.5 cm or greater in diameter when dedicated techniques are used, but it does not readily detect small brainstem lesions such as infarctions or demyelination.[33-40]

In general, most cochlear disorders such as otosclerosis are evaluated by high-resolution CT imaging. Similarly, preoperative assessment for cochlear implants is usually best accomplished by using thin-section CT with reformatted multiplanar images. In patients with congenital etiologies for hearing loss, recent reports suggest that high-resolution MR imaging is more useful for surgical planning.[41,42]

Conductive Hearing Loss

Conductive hearing loss results from pathologic changes of either the external or middle ear structures and is best evaluated with CT. Indications include suspected complications of acute and chronic otomastoiditis, such as cholesteatoma, and the assessment of congenital or vascular anomalies. Fistulization through the tegmen tympani of the temporal bone is usually detected by CT, though the actual involvement of the meninges and veins is better assessed by MR imaging. MR imaging is also indicated when complicated inflammatory lesions are suspected to extend into the inner ear or toward the sigmoid sinus or jugular vein. Neoplasms arising from or extending into the middle ear require the use of both techniques, as their combined data provide essential information. Vascular imaging should be performed when there is suspicion of a paraganglioma extending into the middle ear.[43]

Trauma

CT is used extensively to delineate fractures, ossicular dislocations, fistulous communications, and facial nerve injury and to evaluate post-traumatic hearing loss.[44]

This article is a summary of the complete version of this topic, which is available on the ACR Website at www.acr.org/ac. Practitioners are encouraged to refer to the complete version.

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Clinical Evaluation of the Use of Ginger Extract in the Preventive Management of Motion Sickness

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ABSTRACT

Background: Motion sickness can be triggered in a variety of situations and is characterized primarily by nausea and vomiting. Ginger is widely used in treating conditions including chemotherapy-associated gastrointestinal symptoms, morning sickness, postoperative nausea, and motion sickness.
Objectives: The primary study objective was to evaluate *Zingiber officinale* extract in the treatment of motion sickness. Secondary objectives were to evaluate treatment effect on Motion Sickness Assessment Questionnaire (MSAQ) score and subscores before and after treatment, and to evaluate treatment tolerability.
Methods: Open-label, single-arm study assessing motion sickness outcomes with and without pre-travel oral treatment with *Zingiber officinale* 160 mg extract (containing 8 mg gingerols). All patients answered the MSAQ on 4 separate occasions following a trip of at least 15 minutes in duration: Trip 1 (pretreatment) and Trips 2, 3, and 4 (after oral treatment with study medication). The primary end point was percentage of patients presenting improvement ≥20 score points on the MSAQ during Trip 2, Trip 3, and Trip 4 in comparison to pretreatment score (Trip 1). Secondary end points included percentage of patients presenting improvement in MSAQ subscores during Trips 2, 3, and 4; percentage of patients presenting treatment-related adverse events; and pre- and posttreatment physician assessment scores.
Results: One hundred eighty-four patients were included and 174 completed treatment. A reduction of ≥20 points in total MSAQ score points occurred in 26.52%, 29.89%, and 29.31% of patients from Trips 2, 3, and 4, respectively. There was no significant difference at Trips 2, 3, and 4 in number of patients presenting improvement ≥20 score points ($P = 0.9579$). There was a significant reduction in total MSAQ scores from Trips 2, 3, and 4 ($P < 0.0001$) compared with Trip 1. Total MSAQ scores did not vary at each trip taken under treatment ($P = 0.28$). There were significant ($P < .001$) improvements in all domain subscores from Trips 2, 3, and 4 in relation to scores from Trip 1. There was a significant improvement in physician assessment scores at Visit 2 ($P < .0001$). Adverse events were reported among 31 patients, mainly affecting the gastrointestinal system. Twenty-four patients (13.04%) reported 39 adverse events considered related to treatment. No significant change in physical exam was noted at Visit 2 in relation to Visit 1.
Conclusions: These open label, historically controlled study results suggest the need for randomized, blinded, placebo and active substance controlled clinical trials. (*Curr Ther Res Clin Exp*. 2020; 81:XXX–XXX)

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Clinical therapeutic effects of gastrodin in combination with betahistine on vertigo

A protocol for systematic review and meta-analysis

Yu-Lin Qiao, BD[a], Wen-Qiang Xiang, MD[b], Fang Liu, MD[c,*], Sheng Jin, MD[d]

Abstract

Background: Vertigo is a well-known presenting complaint common in the main care offices as well as departments. It is also regarded as a symptom of vestibular dysfunction and has been expressed as a feeling of motion, specifically rotational motion. As patients grow older, vertigo also becomes a commonly presenting complaint. The current study will carry out a widespread systematic review to estimate clinical therapeutic effects of gastrodin in combination with betahistine on vertigo.

Methods: We will systematically search different databases, including PubMed, EMBASE, Web of Science, the Cochrane Library, Chinese BioMedical Literature Database (CBM), China National Knowledge Infrastructure Database (CNKI), and WanFang to collect the randomised controlled studies that evaluate the efficiency of gastrodin and betahistine in treating patients with vertigo from their inception to November 2020. However, only studies in English or Chinese will be included. Two authors will independently perform selection, data extraction, and assessment of risk of bias for the included papers. Accordingly, any disagreements between the independent authors will be addressed via discussion or by consulting a third author when needful. Additionally, we will use RevMan 5.3 software to perform the data synthesis.

Results: The efficiency of gastrodin and betahistine in treating patients with vertigo will be systematically evaluated.

Conclusions: The current study aims to stipulate more consistent substantiation to explore whether gastrodin combined with betahistine is more effective for the treatment of vertigo.

Registration number: DOI 10.17605/OSF.IO/HQTZA (https://osf.io/hqtza/)

Abbreviations: RCT = randomised controlled trials, CBM = Chinese BioMedical Literature Database, CNKI = China National Knowledge Infrastructure Database, RR = risk ratios, CI = confidence interval, MD = mean difference, SMD = standardized mean difference.

Keywords: vertigo, gastrodin, betahistine, effective, meta-analysis

1. Introduction

Vertigo denotes a type of dizziness or the delusion of motion. Particularly, it is expressed as an observed delusion of motion of either self or environment in the absence actual physical movement.[1,2] The most well-known causes of vertigo include peripheral or central vestibular (or ocular motor disorder), and rarely non-vestibular disorders or functional disorders.[3] In essence, the main aetiologies of vertigo primarily originate from dysfunction of brainstem-cerebellar vestibular vertigo, ocular motor, or sensorimotor circuits. More importantly, cerebellar vertigo is a common term for this group of disorders that share similar symptoms of cerebellar dysfunction on clinical investigation of ocular motor, vestibular, or postural systems.[4–6] Therefore, it is critical to distinguish vertigo from other types like imbalance and light-headedness. Accordingly, therapy for patients experiencing vertigo often consider a multimodal aspect and needs, including physical exercises for eye balance, stance, gait control, as well as pharmacological therapy.[7] Still, these therapies have limited efficacy, and thus, are usually supplemented by some adverse reactions.[8,9]

Gastrodin is an effective monomeric component extracted from the traditional Chinese medicine, Gastrodia. It presents the functions of expanding cerebral blood vessels, improving brain cells tolerance to hypoxia, reducing cerebrovascular resistance, and increasing cerebral blood flow.[10] Foregoing studies have illustrated that gastrodin can present an excellent clinical effect on vertigo due to various reasons.[11] In recent years, there have been many clinical studies of gastrodin combined with betahistine

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The authors have no conflicts of interests to disclose.

The datasets generated during and/or analyzed during the current study are available from the corresponding author on reasonable request.

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Study Protocol Systematic Review

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Linggui Zhugan Decoction for peripheral vertigo

A protocol for systematic review and meta-analysis

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Abstract

Background: Vertigo is a sense of movement or rotation of the patient's own or an external object. At present, western medicine treatment such as vestibular suppressant medications commonly used in clinical practice are ineffective and have adverse reactions. In traditional Chinese medicine, Linggui Zhugan Decoction (LZD) was used by doctors to warm yang for resolving fluid retention, strengthen the spleen and clear away dampness, with significant effect. Recently, some clinical studies have also shown that LZD has reliable effect in treating peripheral vertigo, but there is no systematic evidence. Therefore, this study aims to objectively evaluate the efficacy and safety of LZD in the treatment of peripheral vertigo.

Methods: Eight electronic databases will be searched from inception to August 2020 by 2 independent researchers, in order to collect qualified randomized controlled trials (RCTs) on the LZD treatment for peripheral vertigo. The therapeutic effects according to Clinical efficacy will be adopted as the primary outcomes. RevMan V.5.3 software will be used for the data synthesis and the Cochrane's risk of bias assessment tool will be used to assess the risk of bias.

Results: This review will conduct a high-quality synthesis on present evidence of LZD for peripheral vertigo.

Conclusion: The conclusion of the study will indicate whether LZD is an effective treatment for peripheral vertigo by providing updated evidence.

PROSPERO registration number: PROSPERO CRD 42021238817.

Abbreviations: LZD = Linggui Zhugan Decoction, PRISMA = Preferred Reporting Items for Systematic Reviews and Meta-Analyses, RCTs = randomized controlled trials, TCM = traditional Chinese medicine.

Keywords: Linggui Zhugan Decoction, peripheral vertigo, protocol, systematic review

1. Introduction

Vertigo is one of the most familiar chief complaints in the department of neurology, presenting as a sense of movement or rotation of the patient's own or an external object,[1] it can be divided into peripheral vertigo and central vertigo.[2] Peripheral vertigo refers to vertigo caused by the vestibular receptors lesions in the inner ear and the extracranial vestibular lesions in the inner auditory canal,[3] usually including Meniere's disease, benign paroxysmal positional vertigo (BPPV), drug-induced vertigo, vestibular neuronitis and labyrinthitis.[4–7] According to the data from large population-based studies, from about 15% to over 20% of adults suffer from vertigo yearly, among which peripheral vertigo is accounted for a significant part.[8] As a result of vascular lesions, local inflammation, poisoning, trauma and other factors damaging vestibular function, peripheral vertigo patients are often accompanied by severe vertigo, hearing changes, and autonomic nervous symptoms and other unbearable pain.[9] Therefore, it is necessary to seek for an effective treatment.

Vestibular suppressant, antihistamines, minimal invasive interventions, plugging of the semicircular canal, labyrinthectomy, and neurectomy are routinely used in clinical practice to treat peripheral vertigo. However, these interventions are more or less ineffective or have other adverse effects such as damage to the cochlea and the vestibular organs.[10–12]

XH is the guarantor of the article and will be the arbitrator when meeting disagreements. All research members participated in developing the criteria and drafting the protocol for this systematic review. WL and JZ established the search strategy and they will obtain the hard copies of all articles. HM and LG will independently accomplish the study selection and data extration and assess the risk of bias. HM, LG and YC will perform the data syntheses. The subsequent and final versions of the protocol are critically reviewed, modified and authorized by all authors.

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The authors have no conflicts of interest to disclose.

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Research Article

Chinese Herbal Medicine for Cervicogenic Dizziness: A Systematic Review and Meta-Analysis

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Background. Chinese herbal medicines (CHMs) have been widely used in the treatment of cervicogenic dizziness (CGD) based on their empirical effectiveness and safety. Herein, we reviewed and evaluated the clinical evidence of the efficacy and safety of CHMs for CGD. *Methods*. Among the relevant studies published in 11 electronic databases up to December 2021, only randomised controlled trials were included. Methodological quality was assessed using the revised Cochrane risk-of-bias tool for randomised trials, and the strength of evidence for the main outcomes was evaluated using the grading of recommendations assessment, development, and evaluation system. *Results*. All 35 included randomised controlled trials with 3,862 participants were conducted with six types of modified CHM and four types of active controls. More than half of the included studies were of low quality because of the high risk of bias due to deviations from intended interventions. CHM plus active control was more effective in the treatment of CGD than active control alone. CHM plus anti-vertigo drugs, CHM plus manual therapy, CHM plus acupuncture therapy, and CHM plus manual and acupuncture therapy were all effective in treating CGD, with CHM plus manual and acupuncture therapy showing the most reliable effect. All CHMs were effective for specific patterns of CGD when administered with active controls, with Dingxuan Tang and Yiqi Congming Tang demonstrating the most reliable effects. No serious adverse events were reported in any of the included studies. *Conclusion*. The current evidence suggests that CHM may enhance the treatment of CGD when combined with other treatments without serious adverse events. Further high-quality evidence is needed to draw definitive conclusions.

1. Introduction

Cervicogenic dizziness (CGD), a major cause of dizziness, is associated with a variety of symptoms, such as headache, unsteadiness, light-headedness, perception of spinning, nausea, and general disorientation, coexisting with neck pain or stiffness [1–4]. Its prevalence is estimated to be 6.4–8.5% [5–7]; however, CGD is common in older patients, especially those with cervical spine dysfunction. Therefore, there is growing apprehension that the number of patients with CGD will increase in accordance with a worldwide ageing population [8–10].

Although it is known that CGD originates from the cervical spine, its pathogenesis remains unclear [11]. Until now, the most prevalent hypothesis is that CGD is caused by disharmonic hyperactivity of the cervical mechanoreceptors located in the joints, ligaments, and muscle spindles, which occurs when the proprioceptive system of the neck is damaged due to muscular fatigue, degeneration, or trauma [10, 12–14]. In a recent review, CGD was classified according to the aetiopathological mechanisms into neural types, comprising degenerative cervical spine disorder, whiplash-associated disorder, and Barré–Liéou syndrome, and vascular types, comprising Bow Hunter's syndrome and Beauty

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Exploring the active ingredients and mechanism of qianglidingxuan tablets for vertigo based on network pharmacology and molecular docking

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ABSTRACT

Vertigo is a common disease, which is a kind of motor or positional illusion caused by the obstacle of spatial positioning. Qianglidingxuan Tablets (QLDX) tablets tablet has a significant effect in the treatment of vertigo, but its active components and mechanism is not clear. In this study, we explored the effective components and mechanism of QLDX tablets in treating vertigo using network pharmacology and molecular docking. Herein, we found 163 potential targets corresponding to 60 bio-active components of QLDX tablets, and 160 known vertigo-related targets. Among which, 41 targets were shared between potential targets of QLDX tablets and known vertigo related targets. The mainly active components included flavonoids, volatile oil, alkaloid, and polysaccharides. Potential targets mainly regulating of cell response to chemical stress, oxidative stress, reactive oxygen species, epithelial cell proliferation, lipopolysaccharide, apoptosis signal pathway and steroid hormones. Additionally, molecular docking verified that the active compounds suchilactone in Gastrodia rhizome, epicatechin and liriodendrin in Eucommia ulmoides bark, myricanone in Ligusticum chuaxion, acacetin-7-O-β-D-galactopyranoside in Wild chrysanthemum, and kaempferol in Eucommia ulmoides leaves with the top core genes ESR, AR, ERBB2, EGFR, MAPK1 and CASP8. This work systematically explored the anti-vertigo mechanism of QLDX tablets and provides a novel perspective for future pharmacological research.

1. Introduction

Vertigo is motor or positional illusion caused by the obstacle of spatial positioning [1]. It is a common clinical disease. It mostly occurs in the middle-aged and elderly people. Many epidemiological and meta analyses show that the pathogenesis is mostly related to hypertension, diabetes, hyperlipidemia and atherosclerosis [2–4]. In addition, brain injury [5], encephalitis [6], anemia, inner ear diseases [7], mental diseases [2], taking drugs [7] and other reasons will cause vertigo, too.

Qianglidingxuan (QLDX) tablets are exclusively produced by Shaanxi Hanwang Pharmaceutical Co., Ltd. and are included in the Chinese Pharmacopoeia, which is composed of five Chinese herbal medicines: the root of *Gastrodia elata* Bl. (Gastrodia rhizome, Tianma in Chinese), the bark of *Eucommia ulmoides* Oliver (Eucommia ulmoides bark, Duzhong in Chinese), the inflorescence of *Chrysanthemum indicum* L. (Wild chrysanthemum, Yejuhua in Chinese), the root of *Ligusticum chuanxiong hort* (Ligusticum chuaxion, Chuanxiong in Chinese), the leaves of *Eucommia ulmoides* Oliver (Eucommia ulmoides leaves, Duzhongye in Chinese). Clinically, it is mainly used to treat hypertension, arteriosclerosis, hyperlipidemia and headache, dizziness, tinnitus, insomnia caused by the above diseases. It is a commonly used drug for the treatment of vertigo [8–14].

According to our previous research and literature reports, QLDX tablets composed of a variety of chemical components, such as gastrodin, gastrodin polysaccharide, *p*-hydroxybenzyl alcohol, *p*-hydroxybenzaldehyde, palisenoside, terpineol diglucoside, quercetin, geniposide, aucubin, chlorogenic acid, caffeic acid, ferulic acid, apigenin, ligustilide, and other chemical components [15–17]. Among them, pinoresinol diglucoside, quercetin, geniposide, aucubin, caffeic acid, ferulic acid, chlorogenic acid, apigenin, ligustilide and other chemical components can reduce blood pressure; Quercetin, chlorogenic acid and ferulic acid can reduce blood lipid; Gastrodin, *p*-hydroxybenzyl alcohol

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