









Chinese Patent Medicines for Cervical Spondylosis: A Comprehensive Review and Current Status of Clinical Research

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Abstract: In this study, an overview review method was employed to systematically categorize proprietary Chinese patent medicines (CPM) for cervical spondylosis listed in the national authoritative drug catalogues and assess their current clinical research status. Literature management and data extraction were performed by searching the databases (updated until January 26, 2025) using EndNote and Excel, and the results were presented visually. A total of 31 proprietary CPMs were included in the study, with activation of blood circulation and removal of blood stasis being the most common therapeutic effects. Involving 112 medicinal ingredients, Pueraria lobata Radix is the most commonly used Chinese medicine ingredient. A total of 130 articles were screened from the literature, with the highest number of studies focusing on Jingtong granules (tablets) (24.62%). The number of studies peaked in 2023, with 77.69% of the studies being randomized controlled trials. Among these, 126 were clinical trial studies, with a maximum sample size of 528 participants. The most common intervention regimen involved CPM combined with western medicines versus western medicines alone (17.46%). The intervention duration was 4 weeks (25.40%), with the main outcome measure being the “Total Effective Rate (TER)” (86.51%). This study demonstrates that CPM has strong potential for treating cervical spondylosis. However, issues remain, such as incomplete information in some drug instructions and the lack of standardization in clinical studies, which require further improvement.

Keywords: cervical spondylosis, chinese patent medicines, clinical research, scoping review, rational use of drugs

Introduction

Cervical spondylosis is a common degenerative spinal disorder in clinical practice and is categorized as “Xiangbi” in traditional Chinese medicine (TCM). According to the Global Burden of Disease study, the years lived with disability caused by this condition rank 11th among all diseases worldwide, and its incidence continues to rise.¹ Due to its prolonged course and tendency to recur, cervical spondylosis not only seriously impairs patients' quality of life and work capacity, but also places a sustained burden on individuals, families, and healthcare systems. Therefore, exploring treatment strategies that are safe, effective, and suitable for long-term management has become an important issue in the clinical prevention and treatment of cervical spondylosis.

Surgical and conservative treatments are currently the main interventions for cervical spondylosis. Among them, surgery can effectively relieve clinical symptoms in severe cases; however, it is associated with high costs and a relatively high risk of postoperative complications.^{2,3} For non-critical patients, Western medicine mainly adopts conservative treatment with symptomatic medications, such as nonsteroidal anti-inflammatory drugs and muscle relaxants. However, long-term use of these medications may increase the risk of adverse effects, including gastrointestinal



ulcers, cardiovascular events, hypertension, and renal impairment.⁴ In contrast, conservative treatment in TCM demonstrates unique advantages through multi-target synergistic effects, particularly in improving local microcirculation, inhibiting inflammatory responses, and delaying intervertebral disc degeneration, and has become an important option in the clinical management of cervical spondylosis.^{5,6} Among these therapies, Chinese patent medicines (CPM) are increasingly used in the clinical treatment of cervical spondylosis because, compared with traditional herbal decoctions and Western medicines, they are associated with fewer adverse reactions, greater formulation stability, and greater convenience in administration.⁷

In recent years, clinical studies on CPM for cervical spondylosis have gradually increased. However, existing studies still have obvious deficiencies in methodological design and implementation quality, and systematic evidence synthesis and comprehensive evaluation remain lacking. On the one hand, the therapeutic functions, indications, compositions, and clinical indications of different CPM are relatively scattered, and the related information has not been systematically organized. On the other hand, published clinical studies still show clear shortcomings in study design, interventions, outcome measures, and reporting quality, resulting in an unclear overall picture of the available evidence and limiting its effective use in clinical practice and future research. Although CPM have been widely used in the treatment of cervical spondylosis, there is still a lack of systematic organization and comprehensive evaluation of the relevant CPM listed in national authoritative drug catalogues and of the current status of their clinical research. This is precisely the key issue that this study aims to address.

A scoping review is a method for comprehensively examining a particular field and providing researchers with a broad overview of the available information.⁸ Therefore, this study employed a scoping review to systematically summarize CPM for cervical spondylosis and the related clinical research evidence, with the aim of providing evidence-based support for clinicians and researchers and promoting the standardized application of CPM in the treatment of cervical spondylosis.

Materials and Methods

Drug Retrieval

Search Strategy

Using “cervical spondylosis,” “neck-shoulder pain,” and “Xiangbi (cervical bi syndrome)” as search terms, we searched the 2020 edition of The Chinese Pharmacopoeia (ChP), the 2024 edition of the National Reimbursement Drug List for Basic Medical Insurance, Work-Related Injury Insurance and Maternity Insurance (NRDL), the 2018 edition of the National Essential Medicines List (NEML), and the Yaozhi Database. A total of 64 Chinese patent medicines were identified. After excluding 33 duplicate medicines or those with indications inconsistent with the target disease, 31 Chinese patent medicines were ultimately included. The detailed screening process is shown in [Figure 1](#).

Inclusion Criteria

CPM whose indications include “cervical spondylosis,” “neck-shoulder pain,” and “Xiangbi (cervical bi syndrome).”

Exclusion Criteria

Duplicate CPM and those with indications that did not meet the diagnostic criteria for cervical spondylosis were excluded.

Information Extraction and Standardization of Traditional CPM

Based on the package inserts retrieved from the YaoZhi Network database, the dosage form, efficacy, main indications, drug composition, excipients, pharmacology and toxicology, drug interactions, Adverse Reactions (ARs), contraindications, precautions, specifications, and pricing information of CPM were entered into an Excel spreadsheet. Pricing was based primarily on the latest winning bid prices from YaoZhi Network and supplemented by JD Pharmacy data, with all values rounded to two decimal places. Finally, all the data were consolidated into a unified Microsoft Excel 2021 spreadsheet. Chinese herbal names were standardized according to the “Herbal Materials and Sliced Herbs” standards in the 2020 edition of the ChP. For example, “Calcined Oyster Shell” was uniformly standardized as “Oyster Shell.” CPM

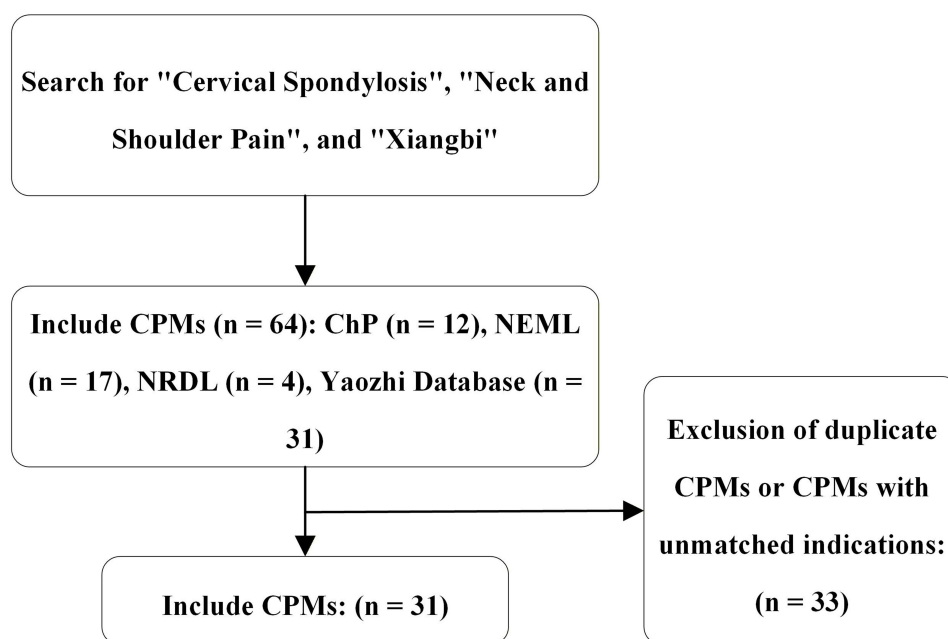


Figure 1 CPM Screening Process. This figure illustrates the screening process of CPM. The meanings of core abbreviations involved in the figure are as follows. **Abbreviations:** CPM, Chinese patent medicine; ChP, The Chinese Pharmacopoeia; NEML, National Essential Medicines List; NRDL, National Reimbursement Drug List for Basic Medical Insurance, Work-Related Injury Insurance and Maternity Insurance.

with identical active ingredients but different dosage forms (eg., “Jingtong Granule” and “Jingtong Capsule”) were classified under the same entry.

Literature Search

Literature Search Strategy

The Chinese databases China National Knowledge Infrastructure (CNKI), Wanfang Data, China Science and Technology Journal Database (VIP), and China Biomedical Literature Service System (CBM), as well as the English databases PubMed, Embase, Web of Science, and Cochrane Library, were searched. Chinese search terms included “cervical spondylosis,” “neck and shoulder pain,” “cervical stiffness,” and the names of 31 pre-selected CPM, such as “Meridian-Unblocking Pain-Relieving Plaster” and “Zhuanggu Shenjin Capsules.” English database search terms included disease names such as “cervical spondylosis” and “neck and shoulder pain,” as well as drug names such as “tongluoqutong” and “zhuanggushenjin.” Literature retrieval was conducted using database-specific search strategies and covered the period from the inception of each database to January 26, 2025.

Inclusion Criteria

(1) Study Population: Multiple clinical subtypes of cervical spondylosis were included, such as myelopathic, radicular, vertebral artery, cervical, and sympathetic types. (2) Intervention Protocol: The experimental group had to use one of the 31 predefined CPM within a double-arm trial design. The control group could receive traditional Chinese external therapies, Western medical treatments, or a combination thereof, with no restrictions on placebo use. (3) Study Design: Eligible study types included randomized controlled trials, non-randomized controlled trials, cohort studies, case-control studies, case series studies, cross-sectional studies, systematic reviews, systematic review re-evaluations, and meta-analyses. Eligible languages were Chinese and English. (4) Document Type: Only journal articles were included.

Exclusion Criteria

The exclusion criteria were as follows: (1) clinical studies involving other diseases; (2) duplicate publications and literature for which the full text was unavailable; (3) studies in which the control group received the included CPM or combined it with other Chinese herbal formulations; (4) single-arm or three-arm trials; and (5) literature types including

animal experiments, case reports, expert opinions, reviews, pharmacology studies, mechanism of action research, network pharmacology, and data mining studies.

Literature Screening and Information Extraction

EndNote 20 was used for literature management. First, duplicate records were removed from the imported literature data. Subsequently, screening was performed according to the predefined inclusion and exclusion criteria. The workflow was as follows: (1) Preliminary Screening: Studies that did not meet the criteria were excluded after screening the titles and abstracts. (2) Full-Text Screening: Potentially eligible studies underwent full-text retrieval and review for secondary screening, and the specific reasons for exclusion and the number of excluded studies were documented. (3) Data Extraction: Information from the finally included studies was categorized and organized in an Excel spreadsheet, primarily including basic bibliographic information (title, author, publication year, and journal name), study characteristics (study population and study type), intervention protocols (sample sizes of the experimental and control groups, specific intervention measures, and treatment duration), and study outcomes (efficacy evaluation indicators). Of the 1,901 records retrieved from the databases, 1,143 were excluded as duplicates, leaving 758 records. After title and abstract screening according to the inclusion and exclusion criteria, 601 records were excluded, leaving 157 articles for full-text review. Following full-text assessment, a further 27 articles were excluded. Ultimately, 130 studies were included. The screening workflow is illustrated in Figure 2.

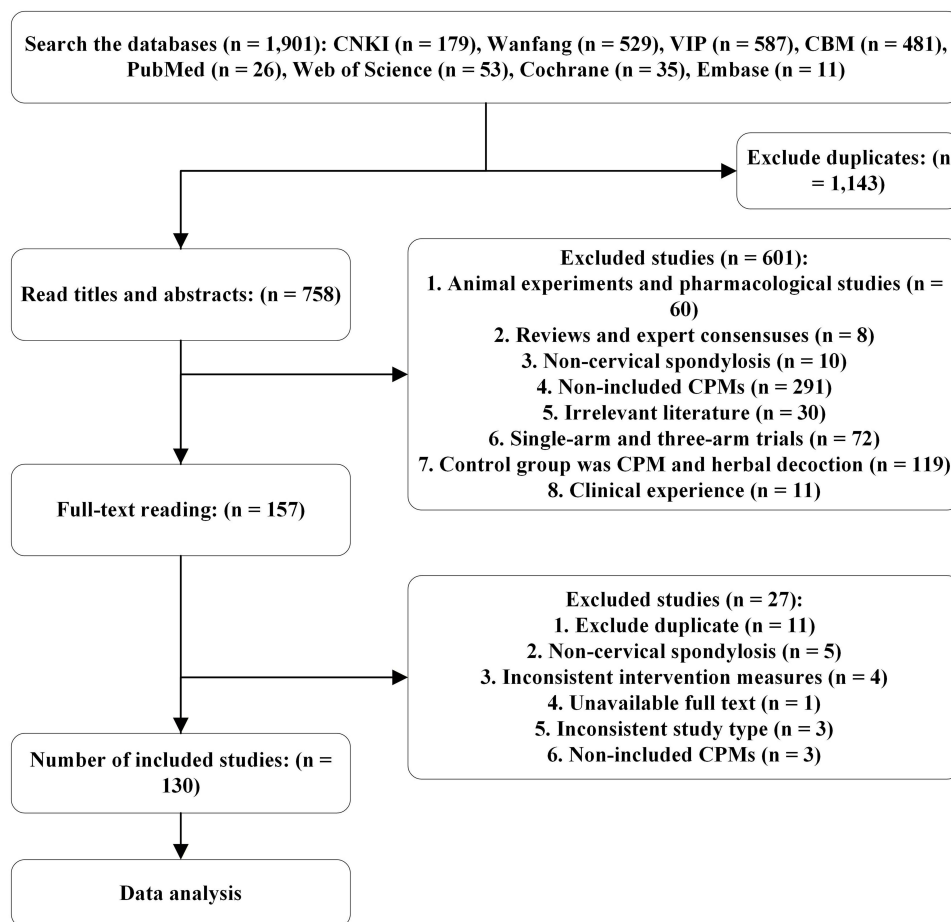


Figure 2 Literature Screening Process. This figure presents the literature screening process of this study, including the database sources of literature retrieval, the total number of literatures obtained by preliminary retrieval, the preliminary and secondary screening processes based on inclusion and exclusion criteria, clarifies the specific reasons for excluding literatures at each stage, and finally obtains the number of literatures that meet the analysis requirements of this study. The meanings of core abbreviations involved in the figure are as follows.

Abbreviations: CPM, Chinese patent medicine; CNKI, The Chinese databases China National Knowledge Infrastructure; VIP, China Science and Technology Journal Database; CBM, China Biomedical Literature Service System.

Data Analysis

The research findings were analyzed systematically using multiple data presentation methods: (1) three-line tables were used to present the basic information, pricing details, clinical study types, and intervention measures for 31 CPM; (2) word clouds were used to visualize the compositional characteristics of traditional Chinese medicine formulas, with font size and color gradients indicating the frequency of use of each ingredient; and (3) bar charts, line charts, and bubble charts were used to visually analyze the number of publications, publication dates, and outcome measures.

Results

Drug Information

Source

A total of 31 CPM were included, and their respective sources were identified. Details are provided in Table 1. Additionally, four CPM were identified in the three major drug directories: Tongluo Qutong Plaster, Jingfukang Granules, Jingshu Granules, and Gutongling Tincture.

Table 1 Sources of CPM

Name	Source
Tongluo Qutong Plaster	①②③④
Zhuanggu Shenjin Capsule	①②③④
Shenjin Dan Capsule (Tablet)	①②④
Jingfukang Granule	①④
Jingshu Granule	①②③④
Jingtong Granule (Capsule/Tablet)	①②③④
Shujin Tongluo Granule	①②④
Gentongping Granule (Capsule/Tablet/Chewable Tablet)	①②④
Gutongling Tincture	①④
Fugui Gutong Tablet (Capsule/Granule)	①②③④
Gucining Tablet	①②④
Jingtong Granule (Capsule)	①②④
Guiqi Huoxue Capsule	②④
Zhanjin Huoxue Powder	②④
Zhentong Huoluo Tincture	②④
Tenghuang Jiangu Pill (Capsule/Tablet)	②④
Chuanhua Zhitong Film	④
Dange Jingshu Capsule	④
Gujin Pill (Capsule/Tablet)	④
Jingkang Capsule (Tablet)	④
Jingtongling Capsule (Medicated Wine)	④
Shujing Mixture	④
Kanggu Zengsheng Tablet	②④
Longgu Jingzhui Capsule	④
Qige Granule (Oral Liquid)	④
Wantong Jingu Tablet	②④
Zideng Capsule (Tablet)	④
Guiyuan Jingu Ning Wet Compress	④
Jiannao Yiqi Tablet	④
Qishe Pill	④
Yufeng Ningxin Tablet	①②④

Notes: ①: ChP ②: NRDL ③: NEML ④: Yaozhi Database.

Indications and Therapeutic Effects

By reviewing the drug labels, the efficacy of 31 proprietary Chinese patent medicines (CPM) was analyzed descriptively. The most frequently reported therapeutic effects included circulating blood or transforming stasis (32 occurrences), alleviating pain (24 occurrences), relaxing tendons or unblocking meridians (22 occurrences), and removing wind or dissipating cold (13 occurrences). A total of 16 CPM (51.61%) directly specified their indications, such as Zhuanggu Shenjin capsules, which are used for cervical spondylosis caused by deficiency of the liver and kidney and cold dampness obstructing the meridians. Among them, the most common pattern was stagnant blood obstructing the meridians (6 CPMs), followed by deficiency of the liver and kidney (4 CPMs), wind cold affecting the meridians (2 CPMs), and blood stasis due to qi deficiency (2 CPMs). Regarding the Western medicine classification of cervical spondylosis, only Tongluo Qutong Plaster, Zhuanggu Shenjin Capsules, Jingshu Granules, Jingtong Granules (Capsules/Tablets), Guiqi Huoxue Capsules, and Qige Granules (Oral Liquid) clearly indicated their use for the nerve root type of cervical spondylosis, as detailed in [Table 2](#).

Table 2 Therapeutic Effects and Indications of CPM

Name	Therapeutic Effects	Indications
Tongluo Qutong Plaster	Circulate blood and unblock meridians, dissipate cold and eliminate dampness, resolve swelling and alleviate pain.	Indicated for lumbar and knee osteoarthritis, manifested as joint pain (stabbing or dull), joint stiffness, limited flexion-extension, and aversion to cold with cold limbs. It is also indicated for cervical spondylosis (radiculopathy type), manifested as neck pain, shoulder and arm pain, limited neck movement, limb numbness, aversion to cold with cold limbs, etc.
Zhuanggu Shenjin Capsule	Tonifies liver and kidney, strengthens the sinews, unblocks meridians and alleviates pain.	Indicated for radiculopathy-type cervical spondylosis caused by liver and kidney deficiency and cold dampness obstructing the meridians, with symptoms including shoulder and arm pain, numbness, and limited mobility.
Shenjin Dan Capsule (Tablet)	Relax tendons and unblock meridians, circulate blood and transform stasis, resolve swelling and alleviate pain.	Indicated for sequelae of fractures, cervical spondylosis, hypertrophic spondylitis, chronic arthritis, sciatica, and peri-arthritis of the shoulder caused by blood stasis obstructing the meridians.
Jingfukang Granule	Circulate blood and unblock meridians, dispel external wind and alleviate pain.	Indicated for cervical spondylosis caused by rheumatic blood stasis obstruction, with symptoms including dizziness, neck stiffness, shoulder and back pain, and arm numbness.
Jingshu Granule	Circulate blood and transform stasis, warm meridians, open the orifices and alleviate pain.	Indicated for radiculopathy-type cervical spondylosis with blood stasis obstructing the meridians, manifested as neck and shoulder stiffness, pain, and migratory pain in the affected upper limb.
Jingtong Granule (Capsule/Tablet)	Circulate blood and transform stasis, circulate qi and alleviate pain.	Indicated for radiculopathy-type cervical spondylosis due to blood stasis and qi stagnation obstructing the meridians. Symptoms include pain in the neck, shoulder, and upper limbs, with stiffness or migratory numbness and pain.
Shujin Tongluo Granule	Tonify liver and kidney, circulate blood and relax tendons.	Indicated for cervical spondylosis due to liver and kidney yin deficiency, and qi stagnation with blood stasis. Symptoms include dizziness, headache, distending pain or stabbing pain, deafness, tinnitus, neck stiffness, pain in the neck, shoulders, and back, limb numbness, lassitude, soreness in the lower back and knees, darkened lips, and a dark red tongue body or ecchymosis.
Gentongping Granule (Capsule/Tablet/Chewable Tablet)	Circulate blood, unblock meridians and alleviate pain.	Indicated for cervical and lumbar spondylosis due to wind cold obstructing the meridians, manifested as shoulder and neck pain, limited movement, and upper limb numbness.
Gutongling Tincture	Warm meridians and dissipate cold, eliminate wind and circulate blood, unblock meridians and alleviate pain.	This product is used for lumbar and cervical spondylosis, osteoarthritis, peri-arthritis of the shoulder, and rheumatoid arthritis.
Fugui Gutong Tablet (Capsule/Granule)	Warm the interior and dissipate cold, supplement qi and circulate blood, resolve swelling and alleviate pain.	Indicated for proliferative arthritis of the cervical spine and knee due to yang deficiency and cold dampness. Symptoms include joint pain, limited flexion and extension, numbness and swelling, relief with warmth, and cold limbs.
Gucining Tablet	Circulate blood and unblock meridians and alleviate pain.	Indicated for cervical spondylosis and lumbar spondylosis with blood stasis obstructing the meridians, with effects of alleviating pain and improving motor function.

(Continued)

Table 2 (Continued).

Name	Therapeutic Effects	Indications
Jingtong Granule (Capsule)	Tonify qi and blood, circulate blood and transform stasis, dispel external wind and drain dampness.	Indicated for neck pain, limited movement, and shoulder pain caused by cervical spondylosis.
Guiqi Huoxue Capsule	Supplement qi and tonify the kidney, circulate blood and unblock meridians.	Indicated for cervical spondylosis (mainly radiculopathy-type and mixed radiculopathy-type) with liver and kidney deficiency, and qi deficiency with blood stasis. Symptoms include heavy neck pain, shoulder and back soreness, arm numbness, limpness and weakness in the limbs, dizziness, dark red or pale tongue body with ecchymosis, thin white coating, and a deep, weak pulse or deep, wiry, and hesitant pulse.
Zhanjin Huoxue Powder	Circulates blood and transforms stasis, relaxes tendons and unblocks meridians, resolves swelling and alleviates pain.	Indicated for joint and muscle swelling and pain caused by traumatic injuries, acute soft tissue and other chronic tissue injuries, lumbar muscle strain, joint contusions, peri-arthritis of the shoulder, cervical spondylosis, and lumbar disc herniation.
Zhentong Huoluo Tincture	Relax tendons and unblock meridians, eliminate wind and alleviate pain.	Indicated for acute and chronic soft tissue injuries, arthritis, peri-arthritis of the shoulder, cervical spondylosis, osteophytes, sciatica, and musculoskeletal pain due to overexertion.
Tenghuang Jiangu Pill (Capsule/Tablet)	Tonify the kidney, circulate blood and alleviate pain.	Indicated for hypertrophic spondylitis, cervical spondylosis, calcaneal spurs, proliferative arthritis, and osteoarthropathy.
Chuanhua Zhitong Film	Circulate blood and transform stasis, dissipate cold and alleviate pain.	Indicated for pain caused by rheumatic pain, traumatic injuries, osteophytes, cervical spondylosis, peri-arthritis of the shoulder, lumbar muscle strain, and other conditions.
Dange Jingshu Capsule	Supplement qi and circulate blood, relax the meridians and unblock the collaterals.	Indicated for dizziness, vertigo, neck muscle stiffness, and limb numbness caused by cervical spondylosis with blood stasis obstructing the meridians.
Gujin Pill (Capsule/Tablet)	Circulate blood and transform stasis, relax tendons and unblock meridians, remove wind and alleviate pain.	Indicated for hypertrophic spondylitis, cervical spondylosis, calcaneal spurs, proliferative arthritis, and osteoarthropathy.
Jingkang Capsule (Tablet)	Tonify the kidney, circulate blood and alleviate pain.	Indicated for cervical spondylosis caused by kidney deficiency and blood stasis, with symptoms including neck and shoulder distending pain, numbness, limited movement, dizziness, and tinnitus.
Jingtongling Capsule (Medicated Wine)	Nourish and supplement the liver and kidney, circulate blood and alleviate pain.	Indicated for cervical spondylosis caused by liver and kidney deficiency and blood stasis obstructing the meridians, with symptoms including neck pain and limited movement.
Shujing Mixture	Supplement qi and circulate blood, relax tendons and unblock meridians.	Indicated as an adjunctive treatment for cervical spondylosis causing limited neck movement, shoulder and arm pain, and numbness.
Kangu Zengsheng Tablet	Tonify the kidney, circulate blood and alleviate pain.	Indicated for hypertrophic spondylitis, cervical spondylosis, calcaneal spurs, proliferative arthritis, and osteoarthropathy.
Longgu Jingzhui Capsule	Circulates blood and relaxes tendons, unblocks meridians and alleviates pain.	Indicated for cervical spondylosis, osteoarthritis, sciatica, and the later stages of fractures.
Qige Granule (Oral Liquid)	Warm meridians and circulate blood, remove wind and dissipate cold, unblock bi-impediment and unblock meridians.	Indicated for radiculopathy-type cervical spondylosis with wind-cold obstructing the meridians, causing severe neck pain, shoulder and back pain, limited neck movement, limb numbness, cold limbs, and stiffness in the limbs. Tongue and pulse: the tongue may be purple or dark with ecchymosis, thin or white coating; the pulse may be wiry, tight, or deep and slow.
Wantong Jingu Tablet	Remove wind and dissipate cold, unblock meridians and alleviate pain.	Indicated for bi syndrome, lower back and leg pain, musculoskeletal pain, limited movement, as well as peri-arthritis of the shoulder, cervical spondylosis, rheumatoid arthritis, and osteoarthritis with the above symptoms.
Zideng Capsule (Tablet)	Warm meridians and dissipate cold, supplement qi and circulate blood, relieve convulsions and alleviate pain.	Indicated for cervical spondylosis.
Guiyuan Jingu Ning Wet Compress	Circulate blood and unblock meridians, remove wind and alleviate pain.	Indicated for lower back pain caused by cervical spondylosis, peri-arthritis of the shoulder, tennis elbow, lumbar disc herniation, and lumbar muscle strain.
Jiannao Yiqi Tablet	Supplement qi, raise yang and benefit the brain.	Indicated for dizziness, pale complexion, brittle lips and nails, fatigue, palpitations, and shortness of breath caused by aging or excessive fatigue. It also serves as an adjunctive treatment for cervical spondylosis, cerebral arteriosclerosis, and vertebral insufficiency with the above symptoms.

(Continued)

Table 2 (Continued).

Name	Therapeutic Effects	Indications
Qishe Pill	Supplement qi and transform stasis, remove wind and unblock meridians, relax tendons and alleviate pain.	Indicated for relieving mild to moderate symptoms such as neck pain or discomfort, radiating pain in the upper limbs, upper limb numbness, and fatigue in cervical spondylosis of radiculopathy type.
Yufeng Ningxin Tablet	Relieve convulsions and alleviate pain, increase cerebral and coronary blood flow.	Indicated for dizziness and headache due to hypertension, neck pain, coronary heart disease, angina pectoris, neurogenic headaches, and early-onset sudden deafness.

Composition

Detailed instructions were available for all 31 included CPMs. Except for excipients required for manufacturing, all included formulations were pure herbal preparations. The compositions of these patent medicines contained 112 distinct Chinese herbs, which appeared a total of 319 times. The 14 most frequently occurring herbs were as follows: Puerariae Lobatae Radix (15 times), Olibanum (12 times), Chuanxiong Rhizoma (11 times), Carthami Flos (11 times), Drynariae Rhizoma (10 times), Debark Peony Root (10 times), Astragali Radix (10 times), Myrrha (10 times), Clematidis Radix Et Rhizoma (10 times), Angelicae Sinensis Radix (8 times), Cinnamomi Ramulus (7 times), Notoginseng Radix Et Rhizoma (7 times), Pheretima (6 times), and Glycyrrhizae Radix Et Rhizoma (6 times). Only 32.26% (10) of CPM explicitly listed excipients, with the three most common being dextrin (3 times), ethanol (3 times), and sucrose (2 times). Details are shown in Figure 3.

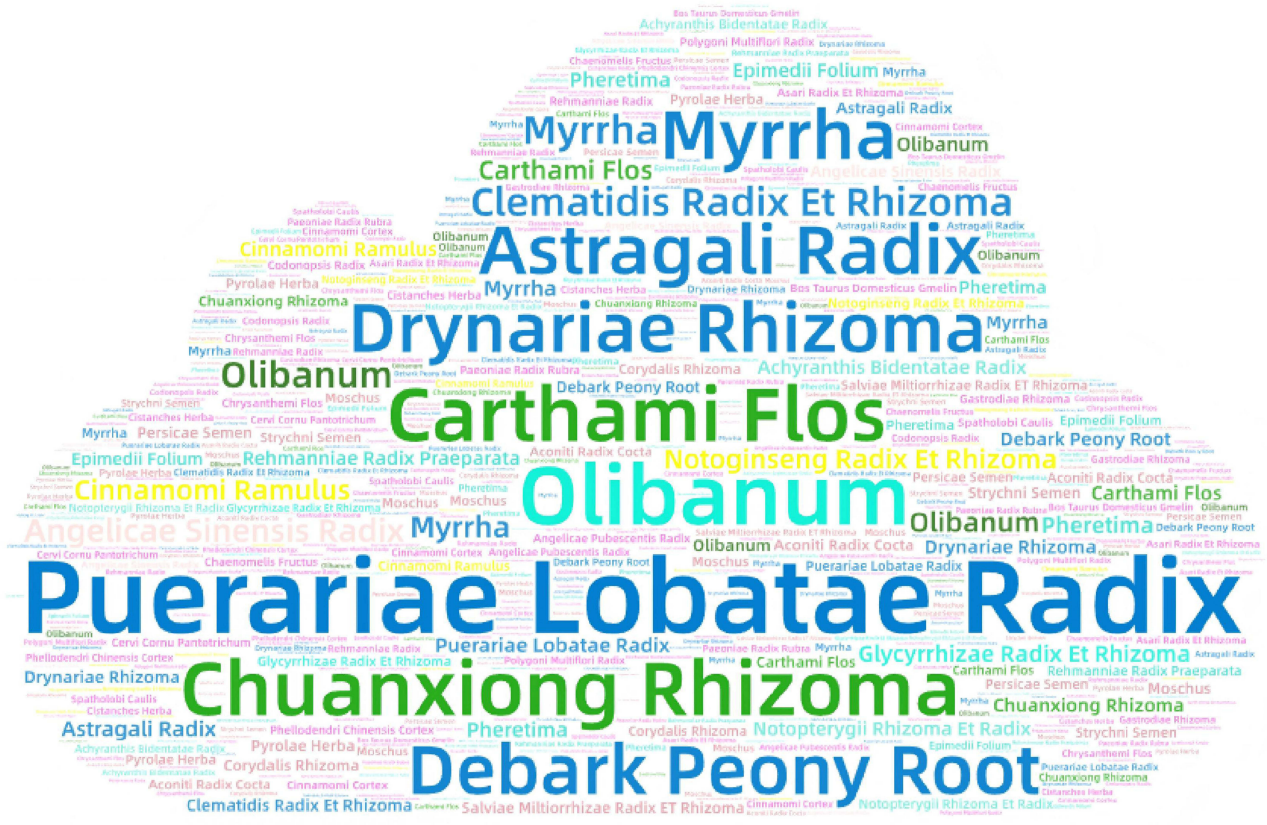


Figure 3 Composition of CPM. This figure shows the composition of CPM.

Price

Using the Yaozhi Network platform as the primary source and JD Pharmacy as a supplementary source, we collected price information for CPM and calculated the average daily price as follows: unit price \times administration frequency (times/day) \times single dose (pills/dose). The results showed that among the 31 CPM included, the average unit price (per capsule/tablet, etc.) was 11.11 yuan, with the highest unit price observed for Jingtongling Medicinal Wine (¥168.00/bottle) and the lowest for Shenjin Dan Capsules (¥0.08/capsule). The highest average daily price was observed for Guiqi Huoxue Capsules (¥84.06/day), whereas the lowest was observed for Shenjin Dan Capsules (¥1.20/day). Detailed findings are presented in Table 3.

Dosage Formulation

A descriptive analysis was conducted of the dosage forms and administration frequency of 31 types of CPM. The results showed a total of 9 dosage forms: capsules (14 occurrences), tablets (13 occurrences), granules (9 occurrences), pills (4

Table 3 Price Statistics of CPM

Serial Number	Name	Latest Winning Bid Price	Unit Price	Daily Average Price	Serial Number	Name	Latest Winning Bid Price	Unit Price	Daily Average Price
1	Tongluo Qutong Plaster	79.20	19.80	19.80	15	Zhentong Huoluo Tincture	38.77	38.77	7.75
2	Zhuanggu Shenjin Capsule	85.68	2.38	42.84	16	Tenghuang Jiangu Pill	160.00	10.00	20.00
3	Shenjin Dan Capsule	4.96	0.08	1.20		Tenghuang Jiangu Capsule	47.52	0.79	4.74
	Shenjin Tablet	48.50	0.22	1.98		Tenghuang Jiangu Tablet	35.83	1.49	11.92
4	Jingfukang Granule	20.20	2.02	4.04	17	Chuanhua Zhitong Film	27.15	4.53	4.53
5	ingshu Granule	35.12	3.90	11.70	18	Dange Jingshu Capsule	35.68	1.49	13.41
6	Jingtong Granule	24.00	4.00	12.00	19	Gujin Pill	34.56	0.72	6.48
	Jingtong Capsule	43.00	1.43	21.45	20	Jingkang Capsule	48.00	1.00	8.00
	Jingtong Tablet	18.65	1.55	18.60		Jingkang Tablet	24.00	1.00	8.00
7	Shujin Tongluo Granule	44.97	5.00	15.00	21	Jingtongling Capsule	83.27	5.20	20.80
8	Gentongping Granule	19.50	3.25	6.50		Jingtongling Medicated Wine	168.00	168.00	13.44
	Gentongping Capsule	33.34	0.56	8.40	22	Shujing Mixture	44.00	44.00	44.00
	Gentongping Tablet	17.64	0.65	9.75	23	Kanggu Zengsheng Tablet	99.32	2.76	22.08
	Gentongping Chewable Tablet	—	—	—	24	Longgu Jingzhui Capsule	27.00	0.45	6.75
9	Gutongling Tincture	65.60	32.80	32.80	25	Qige Granule	41.12	4.11	8.22
10	Fugui Gutong Tablet	0.56	0.56	10.08		Qige Oral Liquid	70.20	7.02	28.08
	Fugui Gutong Capsule	20.05	0.42	7.56	26	Wantong Jingu Tablet	28.17	0.78	3.12
	Fugui Gutong Granule	31.30	5.22	15.66	27	Zideng Capsule	98.00	2.72	32.64
11	Gucining Tablet	69.80	2.91	34.92		Zideng Tablet	40.41	1.68	20.16
12	Jingtong Granule	116.00	9.67	29.01	28	Guiyuan Jingu Ning Wet Compress	39.80	4.42	2.21
	Jingtong Capsule	—	—	—	29	Jiannao Yiqi Tablet	43.02	0.72	12.96
13	Guiqi Huoxue Capsule	336.17	9.34	84.06	30	Qishe Pill	358.00	1.43	71.50
14	Zhanjin Huoxue Powder	79.58	79.58	1.33	31	Yufeng Ningxin Tablet	15.64	0.29	4.35

Notes: The unit is RMB.

occurrences), patches (3 occurrences), oral liquids (2 occurrences), tinctures (2 occurrences), powders (1 occurrence), and medicinal wines (1 occurrence).

Drug Safety Information

By reviewing the Yaozhi Network platform, safety information from the package inserts of the 31 included CPM was analyzed. The results showed that only Tongluo Qutong Plaster, Jing Shu Granules, Jing Tong Granules (Capsules/Tablets), Shujin Tongluo Granules, Fugui Gutong Tablets (Capsules/Granules), Guiqi Huoxue Capsules, Zhentong Huoluo Tincture, Shujing Mixture, Qige Granules (Oral Liquid), Guiyuan Jingu Ning Wet Compress, and Qi She Wan listed ARs. These 11 CPM formulations listed ARs, including gastrointestinal symptoms such as nausea and vomiting (7 instances), skin allergies such as itching (6 instances), cardiovascular symptoms including palpitations and elevated blood pressure (3 instances), headache and dizziness (1 instance), and decreased white blood cell or platelet counts (1 instance). CPM with unclear precautions accounted for 19.35% (6/31).

Studies Included in the Literature Analysis

After screening, a total of 130 articles were included in the literature review, comprising 123 Chinese-language articles and 7 English-language articles, including 126 experimental studies, 2 systematic reviews, and 2 meta-analyses.

Number of Documents

Among the 31 included CPM, only 16 had relevant literature that met the screening criteria. Among these, Jingtong Granules (Tablets) accounted for 24.62% (32 articles), representing the largest number of studies. In the English-language literature, the studied drugs included Jingshu Granules (3 articles), Astragalus Musk Pills (2 articles), Tongluo Qutong Plaster (1 article), and Jingtong Granules (Tablets) (1 article). Additionally, among the 123 Chinese-language articles, Jingtong Granules (Tablets) had the highest number of related studies, at 31. Furthermore, only 10 papers (8.06%, 10/123) were published in core journals, of which 7 (70%, 7/10) focused on Jingfukang Granules. Details are shown in [Figure 4](#).

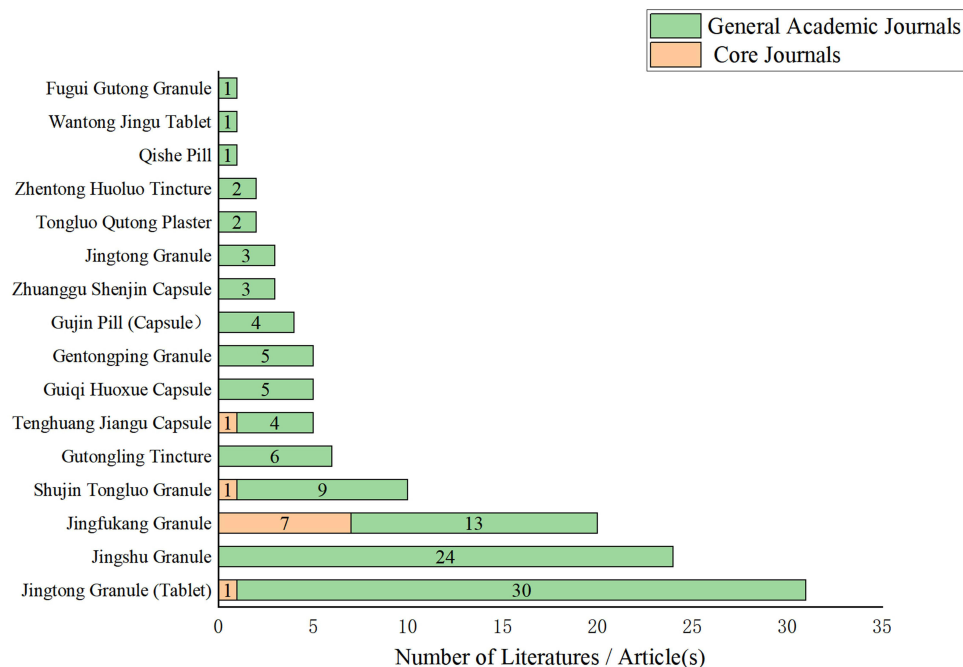


Figure 4 Number of documents. This figure shows the distribution of Chinese patent medicines in the included literatures and the number of core journals and non-core journals.

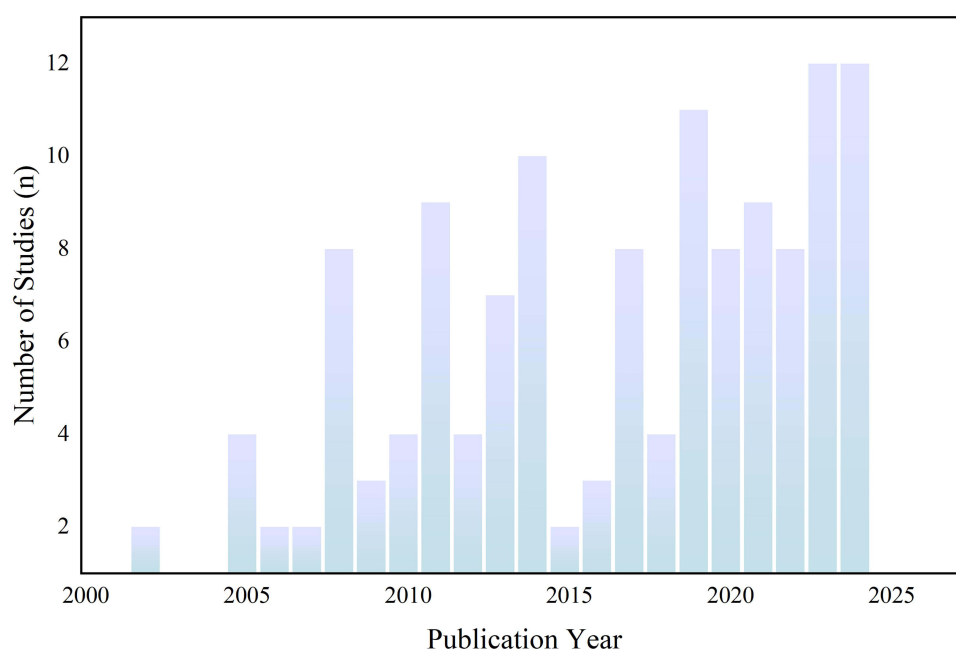


Figure 5 Year of publication of literature. This figure is a statistical chart of the distribution of literature publication years, which clearly shows the change trend of the number of publications of literature related to the theme of this study in different years.

Publication Date

The included literature was published between 2002 and 2024. The number of publications was relatively low from 2002 to 2007, averaging approximately 2–4 papers per year. From 2008 to 2014, the number of publications began to increase, with notable peaks in 2008 (8 papers) and 2014 (10 papers). From 2015 to 2024, the number of publications fluctuated considerably but maintained an overall upward trend. The number of publications reached its peak in 2023 (12 papers). Details are shown in [Figure 5](#).

Research Types and Randomization Schemes

Among the included studies, 126 were experimental studies, of which randomized controlled trials (RCTs) were the most common ($n = 101$). Details are presented in [Table 4](#). Among the RCTs, 49 studies used an appropriate random allocation concealment strategy, whereas 52 either did not specify the strategy used or used an inadequate one. Regarding blinding,

Table 4 Type of Literature Study

Research Type	CPM (Number of Literatures / Article(s))	Total Number of Literatures / Article(s) (Proportion %)
Randomized Controlled Trial	Jingtong Granule (25) Jingshu Granule (23) Jingfukang Granule (11) Shujin Tongluo Granule (8) Gutongling Tincture (5) Jingtong Granule (3) Qishe Pill (2) Tongluo Qutong Plaster (3) Zhuanggu Shenjin Capsule (3) Gujin Pill (Capsule) (4) Guiqi Huoxue Capsule (4) Tenghuang Jiangu Capsule (Tablet) (4) Wantong Jingu Tablet (1) Gentongping Granule (Tablet) (3) Zhentong Huoluo Tincture (2)	101 (77.69)
Non-Randomized Controlled Trial	Jingtong Granule (Tablet) (4) Jingfukang Granule (6) Jingshu Granule (1) Shujin Tongluo Granule (1) Gutongling Tincture (1) Guiqi Huoxue Capsule (1) Gentongping Granule (Tablet) (1) Tenghuang Jiangu Capsule (Tablet) (1) Fugui Gutong Granule (1)	17 (13.08)
Prospective Cohort Study	Jingfukang Granule (2) Qishe Pill (1) Jingtong Granule (1) Gentongping Granule (1)	5 (3.85)
Retrospective Cohort Study	Shujin Tongluo Granule (1) Jingshu Granule (1)	2 (1.54)
Systematic Review	Jingfukang Granule (1) Jingtong Granule (1)	2 (1.54)
Meta-Analysis	Jingshu Granule (2)	2 (1.54)
Case-Control Study	Jingtong Granule (1)	1 (0.77)

7 studies reported the use of blinding, including single-blind (1 study), double-blind (5 studies), and triple-blind (1 study) designs.

Sample Size

Among the 126 clinical studies, the largest sample size was 528 cases, and the smallest was 40 cases. Studies with sample sizes of fewer than 100 accounted for 54.76% (69 studies). The two meta-analyses included 8 and 17 studies, respectively, whereas both systematic reviews each included 3 studies.

Funding

Among the 130 analyzed publications, 18 (13.85%) received grant support. The three most frequently funded products were Jingtong Granules (Tablets) (4 publications), Jingshu Granules (4 publications), and Tenghuang Jiangu Capsules (Tablets) (3 publications).

Intervention Measures

Among the 126 clinical trials included in the analysis, the most frequently used comparison design was “CPM + Western medicine vs. Western medicine,” which appeared in 22 studies (17.46%). Seven studies used a placebo control. In studies in which the control group received Western medicine, methylcobalamin was the most commonly used intervention, appearing in 9 studies (5.56%). Among the 7 cohort studies involving 5 intervention comparison formats, 3 used “CPM vs. Western medicine.” One case-control study used the intervention comparison format “traditional Chinese medicine + manual therapy + rehabilitation exercises vs. traction + Western medicine + cervical collar.” Details are provided in [Table 5](#).

Treatment Course

Among the 126 clinical studies, 11 did not explicitly report the treatment duration. Among the 115 studies that clearly reported the treatment duration, the shortest treatment period was 5 days, whereas the longest was 4 months. Among these, a 4-week treatment course was the most common, accounting for 32 studies (25.40%).

Table 5 Controlled Trial Interventions

Type (Experimental Group vs Control Group)	Number of Articles/Article(s)	Proportion /%
CPM + Western Medicine vs Western Medicine	22	17.46
CPM + Tuina vs Tuina	14	11.11
CPM vs Western Medicine	13	10.32
CPM + Traction vs Traction	12	9.52
CPM vs Placebo	7	5.56
CPM + Tuina + Traction vs Tuina + Traction	7	5.56
CPM + Acupuncture vs Acupuncture	6	4.76
CPM + Acupotomy vs Acupotomy	3	2.38
CPM + Traction vs Western Medicine + Traction	3	2.38
CPM + Block Therapy vs Block Therapy	2	1.59
CPM + Acupuncture vs Western Medicine + Acupuncture	2	1.59
CPM + Acupuncture + Tuina vs Acupuncture + Tuina	2	1.59
CPM + Warm Acupuncture vs Warm Acupuncture	2	1.59
CPM + Tuina vs Western Medicine + Cervical Collar + Traction	2	1.59
CPM + Tuina + Rehabilitation vs Traction + Western Medicine + Cervical Collar	2	1.59
CPM + Hot Compress Therapy vs Hot Compress Therapy	2	1.59
Others	25	19.84
Total	126	100.00

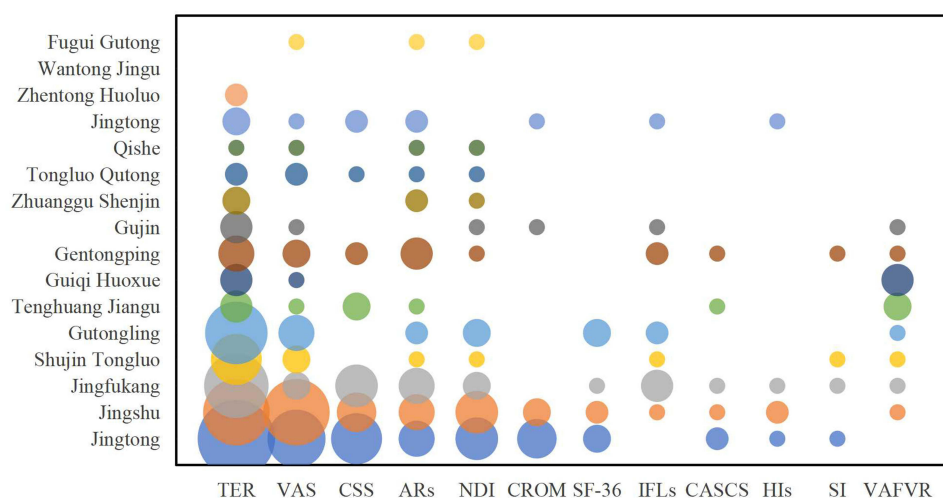


Figure 6 Bubble chart of ending indicators. This figure is a bubble chart of ending indicators. The size of bubbles intuitively reflects the importance of ending indicators or the value of relevant data, and the coordinate axis dimensions show different attribute characteristics of ending indicators, realizing the visual presentation of multi-dimensional ending indicator data. The meanings of core abbreviations involved in the figure are as follows.

Abbreviations: TER, Total Effective Rate; VAS, Visual Analog Scale; CSS, Cervical Symptom Score; ARs, Adverse Reactions; NDI, Neck Disability Index; CROM, Cervical Range of Motion; SF-36, 36-Item Short Form Health Survey; IFLs, Inflammatory Factor Levels; CASCs, Clinical Assessment Scale for Cervical Spondylosis; HIs, Hemorrhological Indicators; SI, Symptom Improvement; VAFVR, Vertebral Artery Blood Flow Velocity and Resistance.

Outcome Indicator

Among the 126 clinical studies, the 12 most commonly used outcome measures were TER (109 studies), Visual Analog Scale (VAS) (52 studies), Cervical Symptom Score (CSS) (31 studies), ARs (30 studies), Neck Disability Index (NDI) (27 studies), Vertebral Artery Blood Flow Velocity and Resistance (VAFVR) (13 studies), Inflammatory Factor Levels (IFLs) (12 studies), Cervical Range of Motion (CROM) (11 studies), 36-Item Short Form Health Survey (SF-36) (9 studies), Clinical Assessment Scale for Cervical Spondylosis (CASCs) (6 studies), Hemorrhological Indicators (HIs) (5 studies), and Symptom Improvement (SI) (4 studies). Notably, 86.51% of the included studies reported outcomes that included “TER.” Additional key outcome measures included safety indicators (4 studies) and treatment outcomes based on TCM syndrome differentiation (1 study). Details are presented in Figure 6.

Follow-up

Among the 126 clinical studies, 14.29% (18 studies) included follow-up periods ranging from 1 month to 12 months. Of these, 5 studies were designed to conduct follow-up visits 3 months after treatment completion.

Discussion

Analysis of Traditional CPM

Price

Research indicates that the average daily cost of CPM for treating cervical spondylosis varies substantially, with a few drugs associated with markedly higher daily costs. Studies have shown that excessively high prices may be attributable to costly ingredients such as musk, safflower, and artificial cow bile, as well as complex manufacturing processes.⁹ Conversely, unusually low prices may stem from market competition and variations in the quality of herbal medicines.¹⁰ The prices of CPM should not be set excessively high, so as to avoid placing an undue financial burden on patients; however, they should also not be set too low, as this may lead to price inversion. Such practices may disrupt market equilibrium and severely compromise drug quality. Relevant authorities should strengthen regulation of the pricing system to ensure an appropriate balance between drug quality and reasonable profit margins.

Dosage Form

Among the 31 CPMs included in this study, capsules, tablets, and granules were the predominant dosage forms, reflecting patients' preference for convenient modes of administration in clinical practice.¹¹ Notably, different dosage forms differ in absorption efficiency, duration of action, and ease of use, thereby providing clinicians with diverse therapeutic options. For instance, medicinal wine formulations may offer particular advantages in terms of anti-inflammatory and analgesic effects.¹² However, external formulations like medicinal wine pose challenges for precise dosing, and their matrix stability and active ingredient uniformity may be affected by variations in manufacturing processes.¹³ Systematic comparative studies are needed to evaluate efficacy differences among various dosage forms, and the standardization and quality control of each formulation should be strengthened, thereby ensuring the stability and reliability of clinical efficacy.¹⁴

Medication Instructions

Regarding composition and excipients, while the composition was fully disclosed, only 32.26% of CPM explicitly stated the use of excipients. Standardized management and information disclosure of excipient components in CPM should be strengthened to reduce potential allergic reactions caused by excipients, enhance drug quality control standards, and safeguard public medication safety and health protection.

In terms of therapeutic indications, the use of traditional Chinese medicine terminology is one of the key elements that define the distinctive characteristics of CPM. Accurate descriptions of TCM syndrome patterns in product labels enable physicians to guide patients' medication use based on TCM theory, thereby reducing medication-related risks.¹⁵ Among the 31 CPM included in this study, approximately half specified TCM syndrome patterns, a few indicated Western medical classifications, while the remainder did not include any syndrome differentiation descriptions. It is recommended that the relevant information be supplemented.

Regarding safety information, contraindicated combinations of Chinese and Western medicines should be clearly stated.^{16,17} However, none of the CPM included in this study provided such information. Only Fugui Gutong Tablets (Capsules/Granules) stated in the [Precautions] section that, due to the presence of aconitine, they should not be used concurrently with drugs containing aconitine. It is recommended that this be clarified in the [Contraindications] section, or that a [Drug Interactions] section be added to explicitly list incompatible drugs, thereby preventing adverse reactions such as liver damage caused by ARs or drug antagonism.^{18,19} Furthermore, only 11 CPM included an [ARs] section in their instructions. This section, together with [Precautions] and [Contraindications], constitutes the core safety information in drug instructions. While their content may overlap, each focuses on distinct aspects, collectively constituting an indispensable safety framework for drug use. The absence of these sections in some instructions may lead to misunderstandings among healthcare professionals and patients, potentially resulting in medication safety issues. Relevant authorities should strengthen oversight to promote the refinement of safety information.

Clinical Research Analysis of Traditional CPM

Number and Distribution of Documents

Among the 130 studies included in the analysis, the annual publication volume showed a fluctuating upward trend, but the inclusion rate in core journals remained very low. The literature distribution exhibited marked clustering, with studies on Jingfukang Granules accounting for 70% of all core publications. Notably, only four systematic review studies have been published to date, none of which were published in core journals. This indicates a substantial gap in the evidence base within this field. More evidence-based medical research should be conducted in this area to enhance the quality of the available evidence.

Clinical Study Design

Randomized controlled trials dominated experimental research, yet they commonly showed methodological flaws. Notably, half of these studies either failed to describe the randomization process or used inadequate randomization, which undermines the reliability and reproducibility of their findings to some extent.²⁰ Only a minority of studies reported blinding, potentially introducing observer bias. It is recommended to strengthen the standardization of

randomization and blinding protocols by utilizing robust random allocation concealment methods, such as centralized randomization systems,²¹ and adopting double-blind or triple-blind designs to effectively control bias and ensure the objectivity and precision of research outcomes. Regarding interventions, the included studies employed diverse approaches, including Western medicine, acupuncture, massage, traction, and others. Due to the nature of interventions like acupuncture and massage, blinding of both practitioners and patients was not feasible, thereby reducing internal validity. It is recommended to implement blinding for outcome assessors to mitigate the risk of bias in trials.²²

Research Scale

This study found significant variation in sample sizes across 126 clinical trials, ranging from 40 to 528 participants, with 54.76% of studies having fewer than 100 participants. This may indirectly reflect limited funding support for clinical research. Furthermore, most studies did not specify how sample size was calculated. It is recommended to use specialized sample size estimation software, integrating key factors such as trial design, outcome measures, and statistical methods, while comprehensively considering variables such as treatment modality, patient compliance, and dropout rates. This approach will help reduce Type I and Type II errors^{23,24} and improve the accuracy of statistical assessment of treatment effects.

The limited number of studies included in systematic reviews reflects both the scarcity of high-quality original research and the limited scope of literature retrieval for systematic reviews. This highlights the insufficiency of the evidence base in this field. Future research should prioritize expanding sample sizes, standardizing study designs, and increasing the number of high-quality clinical studies through multicenter collaborations. Additionally, strategies for literature screening and quality assessment should be improved to broaden the scope of included studies, thereby providing a more robust evidence base for systematic reviews.

Outcome Indicator

Research findings indicate that among 126 clinical studies, 86.51% of publications employed “TER” as one of the outcome measures for efficacy evaluation. This metric is frequently combined with “VAS,” “CSS,” and “NDI” to comprehensively reflect the overall effectiveness of interventions. However, these metrics lack uniform standards, are highly subjective, and carry significant bias, thereby compromising the reliability and scientific rigor of research outcomes. Furthermore, the combined use of outcome measures reveals issues of redundant measurement within similar sub-items, indicating a lack of an established reference core indicator set.²² Only 30 studies reported ARs, and only 4 conducted safety evaluations, indicating that clinical research requires greater emphasis on the comprehensiveness and systematic nature of safety assessments. Follow-up studies were conducted in 14.29% of the literature, primarily to assess long-term efficacy and recurrence rates. Only one study included “treatment outcomes based on TCM syndrome differentiation” among its outcome measures. In fact, pattern differentiation and treatment are critically important for cervical spondylosis management,²⁵ which warrants their inclusion in future efficacy evaluation frameworks. Furthermore, the recurrent nature, significant pain, high disability rates, and elevated prevalence among the elderly associated with cervical spondylosis contribute to high rates of anxiety and depression among patients.^{26,27} We recommend incorporating anxiety assessment scales into outcome measures to more comprehensively reflect the impact of cervical spondylosis on patients’ quality of life.

The above clinical research analyses collectively indicate that the included literature exhibits significant heterogeneity in outcome measures and lacks a unified core indicator set, which may lead to outcome reporting bias.²⁸ This study searched the COMET platform (<https://www.comet-initiative.org/>) and found that a core indicator set for vertebral artery-type cervical spondylosis is under active development, while no relevant core indicator sets for other cervical spondylosis syndromes have been identified. It is recommended to expedite the establishment of core indicator sets for cervical spondylosis to guide the setting of outcome measures for traditional CPM treatments.²⁹

Limitations and Future Directions

The current international (non-Chinese) literature remains relatively limited, and perspectives from overseas research teams have not been fully represented. This phenomenon reflects the relatively limited application of CPMs in the

treatment of cervical spondylosis outside of China, and may also involve a risk of language-related publication bias. Furthermore, this study did not include research involving comorbid conditions, and the number of included studies was limited. Additionally, a systematic quality assessment of the literature was not conducted, which may affect the reliability of the conclusions. It is recommended to consider incorporating conditions such as lumbar disc herniation to increase the volume and scope of the literature, and to apply stricter inclusion criteria along with a standardized quality assessment framework.

Moreover, while graphical presentations allow observation of trends and overall distributions, they do not provide specific data insights, and large data tables can be difficult to interpret intuitively. It may be beneficial to incorporate more innovative tools and methods to reduce repetitive work, use additional visualization techniques, and more clearly and accurately present research findings, thus improving the efficiency and quality of clinical research in traditional Chinese medicine.

Additionally, pricing information was extracted only from the latest bid prices in the Yaozhi database and JD Pharmacy, without considering price differences across various manufacturers. This approach may lead to partial representation of price data and fail to reflect the actual market prices of CPMs from different distribution channels. Future studies should incorporate multi-source price data to enable a more accurate evaluation of market pricing and its rationality.

It is also important to note that the literature analysis in this study did not involve verification by the original study authors, relying solely on reported data for secondary analysis, which may introduce transcription errors and reporting bias. Future research is encouraged to establish collaborative networks for data verification, develop standardized electronic data extraction forms, and implement independent double-check procedures to minimize information bias.

Conclusions

This study systematically analyzed the pharmacological characteristics of CPM in the treatment of cervical spondylosis and its clinical research status. The results showed that oral formulations are predominantly used in clinical practice, with significant price differences across different dosage forms. Additionally, some product labels lack adequate safety information. Clinical research mainly comprises randomized controlled trials, but sample sizes are generally small, and randomization and blinding procedures are often not standardized. Outcome measures heavily rely on TER, with insufficient reporting of safety and long-term follow-up data, and the lack of a unified core outcome set remains a concern. These findings have important implications for clinical practice. On the one hand, CPM has established a certain foundation for the treatment of cervical spondylosis; however, the appropriateness of pricing, differences in dosage forms, and the completeness of safety information on product labels directly affect patient safety and the economic burden. On the other hand, an over-reliance on subjective indicators like TER could compromise the objectivity and comparability of treatment efficacy assessments. Therefore, in clinical applications, greater attention should be given to research quality, safety evidence, and long-term efficacy, rather than relying solely on a single efficacy measure. The findings of this study also provide direction for future research. Future studies should focus on multicenter, large-sample, and rigorously designed clinical trials, improve the implementation of randomization and blinding, and enhance the scientific calculation of sample size. In addition, efforts should be made to accelerate the development of a unified core outcome set for cervical spondylosis, strengthen safety and long-term follow-up evaluations, and incorporate TCM syndrome differentiation and psychological indicators into efficacy assessment systems. Furthermore, comparative studies of dosage forms and multi-source price analysis should be promoted to improve the evidence quality and clinical decision-making value of CPM in the treatment of cervical spondylosis.

Author Contributions

All authors made a significant contribution to the work reported, whether that is in the conception, study design, execution, acquisition of data, analysis and interpretation, or in all these areas; took part in drafting, revising or critically reviewing the article; gave final approval of the version to be published; have agreed on the journal to which the article has been submitted; and agree to be accountable for all aspects of the work.

Funding

The study was supported by the Basic TCM evidence-based capacity building Project of the Affiliated Hospital of Changchun University of Chinese Medicine (2026).

Disclosure

The authors report no conflicts of interest in this work.

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