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Review Article

A Review of Pharmacopuncture Treatment for Frozen Shoulder: A Literature Review of Clinical Trials

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ABSTRACT

The objective of this study was to review clinical trials of pharmacopuncture treatment for Frozen Shoulder and to evaluate trends in this field. The literature search was performed using PubMed, the Cochrane Library, China National Knowledge Infrastructure, and 5 Korean electronic databases. A combination of "pharmacopuncture," "acupoint injection," "Frozen Shoulder," "adhesive capsulitis," and "periarthritis of shoulder" search terms were used. A total of 9 studies were included in this review. The studies were classified into herbal extract-based (5 types) and animal-based (2 types) pharmacopuncture treatment of Frozen Shoulder. There were 14 different acupoints and Ashi points used in the 9 studies. The total volume of herbal extract-based pharmacopuncture injected was usually between 2 mL and 4 mL, and for animal-based pharmacopuncture it was 1 ml. In most studies of Frozen Shoulder, pain was reduced and function was significantly improved after pharmacopuncture treatment. These results demonstrate that pharmacopuncture alleviates pain and restores function in patients with Frozen Shoulder. Further studies must be conducted on pharmacopuncture for management of Frozen Shoulder.

Introduction

Frozen Shoulder (also known as adhesive capsulitis) is a condition with varying degrees of severity. It is characterized by gradual limitation of active and passive shoulder movements, where radiographic findings (other than osteopenia) are absent. Prevalence of Frozen Shoulder in the general population is between 2-5%, and it usually occurs between the age of 50 and 60 years old [1]. Frozen Shoulder can be a chronic condition, lasting 2 to 3 years [2] however, no standard management of the condition exists. A previous review of the treatment of Frozen Shoulder concluded that there was limited clinical evidence for the effectiveness of existing therapeutic treatments [3].

Pharmacopuncture (herbal acupuncture) is a type of Korean medicine treatment that uses an injection of herbal extracts into acupoints based on meridian and herbal medicine theories. Reviews of Korean pharmacopuncture studies have shown that it has been used for the treatment of a variety of diseases, especially musculoskeletal diseases with significant positive effects [4,5].

Although several studies of Korean pharmacopuncture have been published, adequate literature reviews of these studies for specific conditions such as a treatment for Frozen Shoulder have not been performed. Therefore, the purpose of this study was to perform a literature review to report clinical evidence for the use of pharmacopuncture for the management of Frozen Shoulder, and suggest a direction for future research in this field.

Materials and Methods

Search Strategies

This literature review included articles published between January 2000 and August 2018 that focused on the treatment of Frozen Shoulder with pharmacopuncture. Clinical trials were reviewed using Korean and foreign online electronic databases. Foreign databases included; PubMed, Cochrane Library, and China National Knowledge Infrastructure (CNKI). The domestic databases included; Korean Traditional Knowledge Portal (KTKP), Oriental Medicine Advanced Searching Integrated System (OASIS), Research Information Services (RISS), National Assembly Library,

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and the Korean Studies Information Service System (KISS).

For the Korean databases the search terms "Frozen Shoulder," "adhesive capsulitis," and "pharmacopuncture" were used. For the CNKI database a cross-language and related search term, such as "Frozen Shoulder," "adhesive capsulitis," "periarthritis of shoulder," "acupoint injection," "bee venom," and "pharmacopuncture therapy" were used (Fig. 1). The search strategy used in PubMed and the Cochrane Library was based on a combination of medical subject headings outlined in Figure 2. In addition, the data was extracted and classified based on intervention and outcome measures to retrieve relevant articles.

Study selection

Articles selected for inclusion in this review included studies on the treatment of Frozen Shoulder that used (1) pharmacopuncture or acupoint injection, and (2) clinical trials including randomized controlled trials (RCTs) and non-RCTs. Full text articles that met the inclusion criteria were retrieved and read carefully. Articles that were excluded from this review included (1) case reports or preclinical studies, (2) studies that used Western medicine as therapeutic interventions, (3) studies that used other components of Korean medicine, including acupuncture, chu-na, herbal medicine, cupping, and moxibustion, (4) articles that were not original pieces of work, (5) articles that were not published in English, Korean, or Chinese, and (6) duplicate studies.

Data extraction and analysis

After duplicate studies were removed, 2 independent reviewers conducted the first screening process by reading the titles and abstracts of studies to exclude unrelated work. The reviewers then read the full text of each article to exclude irrelevant studies and came to a consensus.

The study design data were extracted and classified using a predefined data extraction form that designated the type of participants, the intervention (materials of pharmacopuncture and injection method), and the outcome measures.

肩周炎	periarthritis of shoulder
穴位注射	acupoint injection
蜂毒	bee venom
针药治疗	pharmacopuncture therapy

Fig. 1. Chinese search terms and meaning.

#1	"Frozen Shoulder"
#2	adhesiv* capsulitis
#3	periarthritis & shoulder
#4	shoulder capsulitis
#5	"contracted shoulder"
#6	#1 or #2 or #3 or #4 or #5
#7	pharmacoacup* OR pharmacopuncture
#8	"herbal acup*"
#9	"acupoint inject*"
#10	bee venom OR bee sting OR apitoxin
#11	#7 or #8 or #9 or #10
#12	#6 & #11

Fig. 2. Search strategy.

Results

Literature search

The search initially generated 379 articles out of which duplicates were eliminated. In the next step, the titles and abstracts of the articles were examined, and those that were not related to the topic of interest were removed. After the screening process, 67 full text articles were retrieved for further review of appropriateness and analysis. There were 58 articles that were excluded for 1 or more of the following reasons: (1) not original research, (2) were abstracts, letters, comments, case reports, reviews, meta-analysis or preclinical studies, (3) articles that used Western medicine for intervention or other components of Korean medicine, (4) not published in English, Korean or Chinese. In total, 9 articles were included in the literature review (Fig. 3).

Study description

Out of the 9 articles included in this review, 7 were RCTs and 2 were non-RCTs. In several studies patients were diagnosed with the condition of Frozen Shoulder by specialized clinicians based on clinical symptoms. Whereas, the majority of Chinese articles used "Criteria for diagnosis and therapeutic effect of diseases and syndromes in traditional Chinese medicine (TCM)" to diagnose patients. The duration of the condition in these patients was usually between 1 to 12 months but extended to a maximum of 36

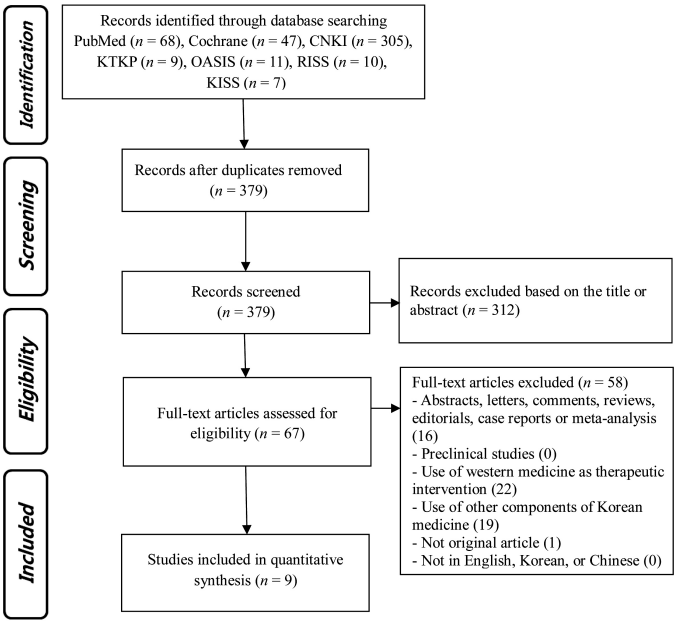

Fig. 3. Study flow diagram.

months in some cases. The average duration of Frozen Shoulder was 5 to 7 months over all articles included in this review (Table 1).

Interventions

Materials used for pharmacopuncture

One study used bee venom (BV) pharmacopuncture as the method of intervention, at a BV concentration of 1:10,000 and 1:30,000. Another study used scolopendrid pharmacopuncture, which involved the use of Scolopendra subspinipes mutilans extract (powder). Seven studies used herbal extract pharmacopuncture, and 2 of the studies used Yi-Tong-Shu (YTS) injection. There were 3 studies that used Fufang-Danggui injection (FDI) and 1 study that used Danxiang injection (DXI) as therapeutic agents. One study used 2 types of pharmacopuncture 1 in the first and 1 second treatment phase. In 1 study, Danshen-Chuanxiong solution (DC) was injected intra-articularly during the first treatment phase and subsequently, Zhengqing Fengtongning solution (ZF) was injected into the acupoints.

Acupuncture points and injection methods

Fourteen acupoints (LI15, TE14, SI9, SI11, GB21, LI14, LI11, LI16, SI12, SI14, SI15, LU5, Jianneiling and Jianhou) and Ashi point were used in the studies reviewed. The most common acupoint used was LI15, which was used in 6 studies. The next most frequent acupoints used were TE14 and SI9, which were utilized in 5 studies. SI11 and Ashi point were used in 4 studies, and GB21, LI14, Jianneiling were selected in 3 studies. LI11 was used in 2 studies, and LI16, SI12, SI14, SI15, LU15, and Jianhou were used in 1 study each (Table 2).

The injection volume used in the studies reviewed differed between animal-based pharmacopuncture and herbal extract-based pharmacopuncture. In the 2 studies that used BV and scolopendrid pharmacopuncture, 0.1 mL of the solution was used per point and a total of 1 mL was injected. Studies using herbal extract-based pharmacopuncture commonly used between 0.5 mL to 1 mL of the solution per point. The total volume of herbal extract injection was usually between 2 mL to 4 mL, but in 1 study that used FDI, a total of 5-10 mL was used, whilst in another study that used 2 kinds of herbal extracts (DC+ZF), 10 mL was injected in the first phase, and 6 mL in the second phase. The treatment frequency was once per 1-2 days in most studies (Table 3).

Outcomes

In most of the Chinese studies recovery ratio was used as the primary outcome, and all 7 studies using this measurement reported statistically significant results compared with the control group. In 3 studies using visual analog scale (VAS), pharmacopuncture significantly reduced the VAS for shoulder pain. Two studies evaluated range of motion (ROM) in the shoulder. In the study that used scolopendrid pharmacopuncture, the active ROM of external and internal rotation improved significantly in the treatment group when compared with the control group. However, in the study that used BV, no significant differences among the groups were observed for ROMs.

Table 1. Clinical Trials of Pharmacopuncture on Frozen Shoulder.

First Author (y)	Study design (RCT or Non-RCT)	Study group	Onset (average)	Criteria for diagnosis
Koh PS [9] (2013)	RCT	Total *n* = 64 BV 1 (22) BV 2 (23) CON (23)	1-12 mo (5.96 mon)	Clinical symptoms
Kim DH [13] (2009)	Non-RCT	Total *n* = 46 SPA (23) CON (23)	< 1 mo: 10 1 ≤ < 3 mo: 13 ≥ 3 mo: 23	Clinical symptoms
Li L [15] (2015)	RCT	Total *n* = 32 YTS (16) CON (16)	1-12 mo (YTS 6.7 ± 1.5) (CON 7.5 ± 1.5)	Criteria for diagnosis & therapeutic effect of diseases & syndromes in TCM
Qian WZ [16] (2012)	RCT	Total *n* = 80 YTS (40) CON (40)	1-12 mo	Criteria for diagnosis & therapeutic effect of diseases & syndromes in TCM
Xu BG [18] (2011)	RCT	Total *n* = 60 DXI (30) EA (30)	1-24 mo (DXI 5.3 ± 6.0) (EA 4.5 ± 5.1)	Criteria for diagnosis & therapeutic effect of diseases & syndromes in TCM
Qi CM [19] (2012)	RCT	Total *n* = 80 FDI (40) CON (40)	3 wk – 27 mo	Criteria for diagnosis & therapeutic effect of diseases & syndromes in TCM
Liu Y [20] (2008)	Non-RCT	Total *n* = 72 FDI (40) EA (32)	1-36 mo (FDI 1.1 ± 0.06 y) (EA 1.2 ± 0.05 y)	Criteria for diagnosis & therapeutic effect of diseases & syndromes in TCM
Chen Z [21] (2015)	RCT	Total *n* = 88 FDI (44) CON (44)	2 wk – 1 y	Criteria for diagnosis & therapeutic effect of diseases & syndromes in TCM
Feng MZ [23] (2017)	RCT	Total *n* = 52 DC + ZF (26) CON (26)	n r	Clinical symptoms

n r, not reported; TCM, traditional Chinese medicine; RCT, randomized controlled trial; BV, bee venom; SPA, Scolopendrid pharmacopuncture; CON, control group; YTS, Yi-Tong-Shu; DXI, Danxiang injection; EA, Electroacupuncture; FDI, Fufang-Danggui injection; DC, Danshen-Chuanxiong solution; ZF, Zhengqing Fengtongning solution.

Table 2. Acupoints in Studies.

Reference	Acupuncture points														Trigger
	LI15	TE14	SI9	SI11	GB21	LI14	Jianneiling (Jianqian)	LI11	LI16	SI12	SI14	SI15	Jianhou	LU5	Ashi point
Koh PS [9] (2013)	◎	◎		◎	◎				◎						
Kim DH [13] (2009)	◎	◎	◎	◎	◎					◎	◎	◎			
Li L [15] (2015)	◎	◎	◎			◎									
Qian WZ [16] (2012)	◎	◎	◎			◎									
Xu BG [18] (2011)	◎	◎	◎				◎								
Qi CM [19] (2012)															◎
Liu Y [20] (2008)	◎			◎		◎	◎	◎					◎	◎	◎
Chen Z [21] (2015)			◎	◎	◎		◎	◎							◎
Feng MZ [23] (2017)															◎
Frequency	6	5	5	4	3	3	3	2	1	1	1	1	1	1	4

In addition, 2 studies used the Shoulder Pain and Disability Index (SPADI), 1 study used the Constant-Murley scale, and 1 study used Melle scores as the outcome measure. The scores showed that pharmacopuncture significantly improved shoulder function and reduced pain in treatment groups when compared with control groups (Table 3).

Discussion

Frozen Shoulder is a condition that causes pain, stiffness, and limitations in movements of the arm. Studies reporting long-term follow-up of the condition have found that up to 40% of patients have persistent but predominantly mild symptoms beyond 3 years, and 15% have long-term disability [6,7]. Several treatment options have been suggested for Frozen Shoulder based on clinical trials however, there is no consensus regarding a standard line of treatment.

Recently, several preclinical studies, clinical case reports, and trials have been conducted on the effect of Korean medicines (acupuncture, herbal medicine, chu-na, and more) on Frozen Shoulder. An acupuncture review article reported reduction in pain and stiffness in patients with Frozen Shoulder [8]. However, a review of pharmacopuncture for the management of Frozen Shoulder has not been reported. Therefore, this review was conducted to collate clinical evidence and suggest a direction for future research.

The studies included in this review used animal-based and herbal extract-based pharmacopuncture. In the animal-based pharmacopuncture study that used BV [9], the injection was prepared from dried honey BV by diluting the powder with saline solution. BV contains anti-inflammatory, anti-nociceptive, and anti-arthritic effects. Specifically, adolapin and melittin components of BV regulate the inflammatory response by inhibiting prostaglandin synthesis and NF-κB activity [10,11,12]. In a study by Kim et al scolopendrid pharmacopuncture, involving the use of the dried Scolopendra subspinipes mutilans powder extract diluted with saline, improved pain and ROM in patients with Frozen Shoulder [13]. Another study reported reduced neuropathic pain and inflammatory damage by inhibition of the expression of c-fos [14].

There were 5 types of herbal extract-based pharmacopuncture that was used in the included studies. There was YTS, which is an injectable solution composed of the herb pair of Asarum sieboldii, Angelica sinensis, Ligusticum chuanxiong Hort, Notopterygium incisum, Angelica pubescens Radix, Saposhnikoviae Radix, and Angelica dahurica. In 2 studies that used YTS injection, improvement were observed in symptoms and physical scores [15,16], and the treatment was reported to have an analgesic and an anti-inflammatory effect on Frozen Shoulder [17].

In one study used DXI which is composed of the herb pair of Salvia miltiorrhiza and Dalbergia odorifera, DXI improved the symptoms of Frozen Shoulder [18].

Three studies reported an improvement in symptoms of Frozen Shoulder with FDI, which is composed of Angelica sinensis, Ligusticum chuanxiong Hort and Carthamus tinctorius [19,20,21]. In the study by Qi et al [19], Constant-Murley shoulder outcome score, which defines the level of pain and the movement ability of shoulder, increased after treatment with FDI, and in the study by Chen et al FDI also improved the duration of pain relief [21]. According to a preclinical study, FDI injection was observed to prevent neuronal apoptosis and facilitate blood circulation by increasing the expression of Bcl-2 and decreasing Bax in a rat model [22].

In the study by Feng et al DC injection, composed of Salvia miltiorrhiza and Ligusticum chuanxiong Hort, and ZF injection, extracted from Sinomenii Caulis, was found to reduce the pain associated with Frozen Shoulder, and improved Melle scores that define functionality at 3 months after treatment [23]. Injection with DC was found to promote blood circulation by alleviating blood stasis by regulating the expression of Bcl-2 and Bax in a rat model of necrosis of the femoral head [24]. In addition, Sinomenine which is a component of ZF injection, was demonstrated to exhibit neuroprotective and anti-epileptic effects by inhibiting the activation of NLRP1 inflammasome and reducing the levels of inflammatory cytokines [25].

Eleven kinds of herbal ingredients were included in herbal extract-based pharmacopuncture. Ligusticum chuanxiong Hort was used in 3 studies, Angelica sinensis in 2, and Salvia

Table 3. Summary of Articles on Pharmacopuncture for Frozen Shoulder.

First Author (y)	Details of needling (Pharmacopuncture)							Other components of treatment	Control or comparative intervention	Outcome measures	Outcomes
	Material of pharmaco-puncture	Number of points	Names of acupoints (bilateral/ unilateral)	Depth of points	Injection volume by point	Total injection volume	Treatment frequency (Total number of sessions)				
Koh PS [9] (2013)	BVA: Bee venom acupuncture - BV 1: 1:10000 concentration BVA- BV 2: 1:30000 concentration BVA	10	LI15, LI16, TE14, GB21, SI11 & 5 points around the shoulder (uni)	0.5-1.0 cm	0.1 mL	1 mL (gradually increased)	2/wk for 8 wk (16 sessions)	Physiotherapy	Normal saline injection (NS)	1. Shoulder pain & Disability index (SPADI) 2. Pain visual analogue scale (VAS) 3. Range of motion (ROM)	1. SPADI: BV1 < NS at 8 wk, 12 wk 2. VAS: BV1 < NS at 8 wk, 12 wk 3. ROM: not significant
Kim DH [13] (2009)	SPA: Scolopendrid pharmaco-puncture 0.03 g/10 cc	8	LI15, TE14, GB21, SI9, SI11, SI12, SI14, SI15 (uni)	n r	0.1 mL	0.5-1.0 mL	2-3/wk (10 sessions)	NA	ACU: Acupuncture, Same points	1. VAS 2. SPADI 3. ROM 4. Apley scratch test	1. VAS: SPA < ACU ($p < 0.05$) 2. SPADI: SPA < ACU ($p = 0.059$) 3. ROM of Int, Ext rotation: SPA > ACU ($p < 0.05$) 4. Apley scratch: not significant
Li L [15] (2015)	YTS: Yi-Tong-Shu injection (herb pair of Asarum sieboldii, Angelica sinensis, Ligusticum chuanxiong Hort, Notopterygium incisum, Angelica pubescens Radix, Saposhnikoviae Radix, Angelica dahurica)	4	LI15, TE14, LI14, SI9 (uni)	n r	1 mL	4 mL	1/d for 20 d (20 sessions)	Functional exercises	DHL: Da-Huo-Luo capsule 4 cap/time, 3 times/d	1. Shoulder symptoms & physical scores 2. Recovery ratio	1. Shoulder score: YTS < CON ($p < 0.05$) 2. Recovery ratio: YTS 93.7% > CON 62.5%
Qian WZ [16] (2012)	YTS: Yi-Tong-Shu injection	4	LI15, TE14, LI14, SI9 (uni)	n r	1 mL	4 mL	1/every other day for 20 d (10 sessions)	Functional exercise	DHL: Da-Huo-Luo capsule 4 cap/time, 3 times/d	1. Shoulder symptoms & physical scores 2. Recovery ratio	1. Shoulder score: YTS < CON ($p < 0.01$) 2. Recovery ratio: YTS 76.0% > CON 73.33% ($p < 0.05$)
Xu BG [18] (2011)	DXI: Danxiang injection (herb pair of Salvia miltiorrhiza & Dalbergia odorifera)	4	LI15, TE14, SI9, Jianneiling (uni)	n r	0.5-1 mL	2 mL	1/d for 10 d (10 sessions)	NA	EA: Electroacupuncture LI15, TE14, SI9, Jianneiling 1/d, 30 min	1. Recovery ratio	1. Recovery ratio: DXI 96.7% > EA 90.0% ($p < 0.05$)
Qi CM [19] (2012)	FDI: Fufang Danggui injection (herb combination of Angelica sinensis, Ligusticum chuanxiong Hort, Carthamus tinctorius)	4-5	Ashi points around the shoulder joint (uni)	n r	n r	5-10 mL	3/wk for 3 wk (9 sessions)	Functional exercises	Physiotherapy (Wax therapy, Electrotherapy, Ultrawave therapy) 1/d for 3 wk	1. Constant-Murley scale 2. Recovery ratio	1. Constant-Murley scale: FDI > CON ($p < 0.05$) 2. Recovery ratio: FDI 82.5% > CON 60% ($p < 0.05$)
Liu Y [20] (2008)	FDI: Fufang Danggui injection (herb combination of Angelica sinensis, Ligusticum chuanxiong Hort, & Carthamus tinctorius)	4-5	SI11, LI15, LI14, LI11, LU5, Jianneiling, Jianhou, Ashi points (uni)	0.5-1.5 inch	0.8-1 mL	4 mL	1/2 d for 10 d (5 sessions)	NA	EA: Electroacupuncture SI11, LI15, LI14, LI11, LU5, Jianneiling, Jianhou 1/d, 30 min	1. Recovery ratio	1. Recovery ratio: FDI 97.5% > EA 81.3% ($p < 0.05$)
Chen Z [21] (2015)	FDI: Fufang Danggui injection	5-6	Jianneiling, SI9, Ashi point, LI11, GB21, SI11 (uni)	n r	n r	n r	1/d for 3 wk (21 sessions)	NA	Celebrex 200 mg orally, 2 times/d	1. Recovery ratio 2. Duration of pain relief	1. Recovery ratio: FDI 90.9% > CON 84.0% ($p < 0.05$) 2. Duration of pain relief: FDI < CON ($p < 0.05$)
Feng MZ [23] (2017)	DC: Intra-articular injection of Danshen-Chuanxiong solution 10 mL ZF: Acupoint injection of Zhengqing Fengtongning solution 6 mL	3-4	Ashi points around the shoulder joint (uni)	n r	n r	DC: 10 mL ZF: 6 mL	DC: once in 1st week ZF: 1/1 d for 1 wk (in 2nd week) (8 sessions)	Physiotherapy & Functional exercise	Betamethasone 1 mL & lidocaine 9 mL mixed solution, intra-articular, 1/wk for 2 wk	1. Recovery ratio 2. Melle scores of shoulder function at 3 months	1. Recovery ratio: DC+ZF 96.2% > CON 80.8% ($p < 0.05$) 2. Melle score: DC+ZF < CON ($p < 0.05$)

NA, not applicable; nr, not reported.

Table 4. Summary of Articles on Pharmacopuncture for Frozen Shoulder.

Type of injection	Herbal ingredients										
	Angelica sinensis	Ligusticum chuanxiong Hort	Asarum sieboldii	Notopterygium incisum	Angelica pubescens Radix	Saposhnikoviae Radix	Angelica dahurica	Salvia miltiorrhiza	Dalbergia odorifera	Carthamus tinctorius	Sinomenii caulis
Yi-Tong-Shu	◎	◎	◎	◎	◎	◎	◎				
Danxiang								◎	◎		
Fufang-Danggui	◎	◎								◎	
Danshen-Chuanxiong		◎						◎			
Zhengqing-Fengtongning											◎

miltiorrhiza was used in 2 studies as the components of pharmacopuncture (Table 4). Ligusticum chuanxiong Hort was reported to inhibit TNF-α production and TNF-α mediated NF-κB activation, thus exhibiting an anti-inflammatory effect [26]. In addition, extract from Ligusticum chuanxiong Hort was reported to have antioxidant activity [27] and inhibited oxidative stress and inflammation through its reaction with Nrf2 and NF-κB pathways [28].

Angelica sinensis which is commonly used in arthritis, was found to reduce excessive synovial fibroblast proliferation in some studies. In the study by Lee et al [29], Angelica sinensis inhibited rheumatoid synovial fibroblast proliferation through the regulation of MMP-1, MMP-3, COX-2 mRNA, protein expression and PGE2 production. Angelica sinensis also inhibited phosphorylation of ERK-1/2, p38, JNK, and the activation of NF-κB.

Salvia miltiorrhiza has been shown to have anti-apoptotic and anti-inflammatory effects. The pro-apoptotic genes, Bcl-2, Bax, and Fas, were shown to be modulated following treatment with Salvia miltiorrhiza [30], and the extract was reported to reduce inflammation on dextran-induced acute arthritis through regulation of ERK1/2 phosphorylation [31].

The commonly used acupoints in the studies included in this review were LI15, TE14, SI9, SI11, GB21, LI14 and Jianneiling. A previous review article reported that LI15, TE14, and LI14 acupoints were frequently used to treat Frozen Shoulder [8].

In this literature review, articles on pharmacopuncture treatment of Frozen Shoulder were retrieved. However, owing to the small number of studies included in the review, only a qualitative analysis of the data could be performed. Further studies must be carried out to provide additional evidence to support these findings.

Conclusion

There were 5 types of herbal extract-based pharmacopuncture (YTS, DX, FD, DC, ZF) and 2 types of animal-based pharmacopuncture (BV, SPA) used in the selected studies. Among herbal extract-based injections, Ligusticum chuanxiong Hort, Angelica sinensis, and Salvia miltiorrhiza were the most frequently used herbal ingredients for pharmacopuncture. Fourteen kinds of acupoints and Ashi point were used in the studies, the most common acupoints used were LI15, TE14, SI9, SI11, GB21, LI14, and Jianneiling. The total volume of herbal extracts injected was approximately 2-4 mL and for animal-based pharmacopuncture it was 1 mL. To evaluate the outcome of pharmacopuncture on Frozen Shoulder, pain and function were measured, and in the majority of studies, significant improvements were demonstrated.

Conflicts of Interest

The authors declare that there are no conflicts of interest regarding the publication of this paper.

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