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[Intervention Review]

Chinese medicinal herbs for mumps

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ABSTRACT

Background

Mumps is an infectious disease caused by the mumps virus. Chinese physicians generally believe that Chinese medicinal herbs are effective in alleviating symptoms and reducing the duration of mumps. Herbalists tend to develop a treatment plan according to the individual's symptoms.

Objectives

To evaluate the effectiveness and safety of Chinese medicinal herbs combined with routine treatments for mumps.

Search methods

We searched CENTRAL (2015, Issue 1), MEDLINE (1948 to January week 4, 2015), EMBASE (1974 to February 2015), CINAHL (1981 to February 2015), AMED (1985 to April 2014), the Chinese Biomedical Database (CBM) (1980 to February 2015), China National Knowledge Infrastructure (CNKI) (1979 to February 2015), VIP Information (1989 to February 2015), and relevant databases of ongoing trials.

Selection criteria

Randomised controlled trials (RCTs) of Chinese medicinal herbs for mumps (with or without complications).

Data collection and analysis

Two review authors independently evaluated trial quality and conducted data extraction. We contacted the trial authors for missing data regarding participant allocation. Some trials allocated participants according to the participants' admission sequence, making it a pseudo-random allocation. None of the trials concealed participants' allocation or used blinding.

Main results

We did not identify any eligible trials for inclusion. We identified 108 studies that claimed to use random allocation. We excluded 104 studies because the allocation methods the authors had used were not actually randomised. We were unable to contact the trial authors of the remaining four studies. These trials require further evaluation and have been allocated to the 'Studies awaiting classification' section.

Authors' conclusions

We did not find any RCTs for or against Chinese herbal medicine used in the treatment of mumps. We hope more high-quality RCTs will be conducted in the future.

PLAIN LANGUAGE SUMMARY**Chinese medicinal herbs for mumps****Review question**

We reviewed the evidence about the effect and safety of Chinese medicinal herbs for mumps.

Background

Mumps (epidemic parotitis) is an infectious illness caused by the multiplication of the mumps virus in the upper respiratory tract. It can range from a mild upper respiratory disease to serious complications. Herbal medicines have been used in traditional Chinese medicine (TCM) as the main therapy to prevent and treat mumps for thousands of years. Many Chinese physicians believe that Chinese medicinal herbs are effective in treating mumps.

Study characteristics

The evidence is current to February 2015. The review authors did not find any randomised controlled trials (RCTs) to provide reliable evidence for the effectiveness and safety of Chinese medicinal herbs for mumps. Although no trials were included, we reviewed the studies and found no reports of adverse events with Chinese medicinal herbs as a treatment for mumps.

Key results

High-quality trials are needed to answer these questions.

BACKGROUND

Description of the condition

Mumps (epidemic parotitis) is a viral infection caused by the multiplication of the mumps virus in the nasal or upper respiratory tract mucosa. The virus is a single-stranded, negative-sense ribonucleic acid (RNA) virus of the genus *Rubulavirus* in the family *Paramyxoviridae* (Hviid 2008). According to Chinese medical literature, mumps was recorded as far back as 640 BC and is still common in many parts of the world (Lu 1956).

Mumps is usually mild, clinically. About one-third of infections are asymptomatic. Clinically manifested infections might begin with a short prodromal phase of headache and low-grade fever, eventually affecting the salivary glands. It can range from a mild upper respiratory disease to viraemia with severe systemic involvement. Epididymo-orchitis develops in 15% to 30% of post-pubertal men who contract mumps (Green 1964; Lambert 1951; Wharton 2006). Testicular atrophy arises in about a third of mumps orchitis but sterility is rare, even after bilateral orchitis (Bertschat 1981; Werner 1950). Clinically manifested meningitis occurs in up to 10% of mumps patients and encephalitis in 0.1%, which can lead to death or long-term sequelae (Hviid 2008). Mumps in early pregnancy may increase the rate of spontaneous miscarriage (Siegel 1966). In addition, 0.005% of infections resulted in permanent deafness and 4% in pancreatitis; in adult women with mumps 5% developed oophoritis and 31% of women over 14 years of age had mastitis (Everberg 1957; Falk 1989; Morrison 1975; Philip 1959). Other conditions such as arthritis, nephritis, thyroiditis, myocarditis, hepatitis, acalculous cholecystitis, kerato-uveitis, haemophagocytic syndrome, thrombocytopaenia, and diabetes mellitus are reported rarely (Brent 2006; Caranasos 1967; Goldacre 2005; Hiraiwa 2005; Hughes 1966; Hviid 2008; Onal 2005; Polat 2005). Death due to mumps is extremely rare (and is generally caused by mumps encephalitis).

A clinical diagnosis of mumps is often based on symptoms, clinical signs, and laboratory testing. A laboratory diagnosis of mumps is based on isolation of the mumps virus, detection of viral nucleic acid, or serodiagnosis.

The majority of World Health Organization (WHO) member countries (120 out of 194) routinely used mumps vaccination in their national childhood immunisation programmes at the end of 2013 (WHO 2014a). It has also been noted that a dramatic decline in morbidity has been associated with countries using the mumps vaccine (Hviid 2008). In some low-income countries that do not use the mumps vaccine in their national vaccination schedules, the burden of mumps infection is unknown due to sparse morbidity data. Occasional outbreaks continue to occur in populations with routine mumps vaccination, with 327,759 cases in China in 2013 (WHO 2014b), 56,000 cases in the UK in 2005 (Gupta 2005), and 1151 cases in 2014 in the USA (CDC 2015). Most of these cases were mild. The source of the mumps infection is not restricted to an infected person but also airborne droplets, direct contact, or contaminated fomites. It can be moderately to highly contagious (Hviid 2008). It is estimated that 90% of people in an unvaccinated population will eventually be infected, with children between five to nine years of age the most likely to be affected (Galazka 1999). There is little information about healthcare costs associated with mumps morbidity.

Description of the intervention

There is no specific antiviral treatment for mumps. Therapy is based on alleviating symptoms and preventing complications. Patients are given antipyretics during febrile periods, and analgesic medicines to relieve pain associated with parotitis, orchitis, and pancreatitis. Lumbar puncture is undertaken to exclude other causes of meningitis. Intravenous fluid infusions may be indicated for patients with pancreatitis or meningoencephalitis. Studies show that interferon alfa-2b for mumps orchitis may be helpful in reducing the duration of symptoms and the incidence of sequelae (Erpenbach 1991; Ku 1999). Intravenous immunoglobulin (IVIG) has been successfully used to treat definite autoimmune-based disorders that are associated with mumps, such as Guillain-Barré syndrome, post-infectious encephalitis, or idiopathic thrombocytopenic purpura (Bajaj 2001; Buyukavci 2005; Sonmez 2004).

Herbal medicines have been used in traditional Chinese medicine (TCM) as the main therapy to prevent and treat diseases (including mumps) for thousands of years (TCM Discovery 2010). Many Chinese physicians believe that Chinese medicinal herbs are effective in alleviating symptoms and reducing the duration of mumps.

How the intervention might work

According to TCM, mumps results from an 'exterior unhealthy influence', which is caused by 'certain seasonal winds or warm pathogens' (TCM Discovery 2008). Depending on the different symptoms or causes, several Chinese medicinal herbs are selected and mixed together to form the herbal treatment for mumps. For example, *Gypsum fibrosum* is used to abate fever (Deng 1998a) and *Bupleurum chinenses* DC is used as an analgesic (Wang 1998). *Radix scutellariae*, Chinese goldthread, root of Zhejiang figwort, *Flos lonicerae*, *Fructus forsythiae*, *Radix isatidis*, Puff-ball, *Fructus arctii*, larva of a silkworm with batrytis, *Herba menthae*, *Bupleurum chinenses* DC, skunk bugbane, *Radix platycodi*, and *Gypsum fibrosum* compounds are usually the main components of a formula for mumps. Pharmacological experiments demonstrate that some Chinese medicinal herbs have antiviral or antibacterial functions, such as *Flos lonicerae* (Deng 1998b) and *Radix isatidis* (Deng 1998c), while *Radix scutellariae* has antiphlogistic properties (Huang 1990).

Supplementary drugs may be added according to particular symptoms (TCM Discovery 2008), as herbalists tend to explore lifestyle and dietary habits with their patients in order to develop a treatment plan far more individualised than most mainstream physicians do. Together, these herbs work to restore the body to a state of balance.

Why it is important to do this review

Chinese medicinal herbs derived mainly from plants are a potential therapeutic resource. It is important to systematically study all Chinese medicinal herbs for efficacy and safety before widespread use. More than 100 varieties of herbal preparations are used in the treatment of mumps in China. There is increasing public interest in the use of a wide range of therapies that lie outside conventional Western medical practices. Many clinical studies of Chinese medicinal herbs for mumps have been performed, such as curcuma oil (Cheng 1999), integrated traditional Chinese and

Western medicines (Luo 2008), and Shuanghuanglian (Sun 2004). These have shown significant benefits in the clinical setting.

There is some evidence that Chinese medicinal herbs may cause adverse events, including allergic reactions and Chinese herbal nephropathy (CHN) (Lampert 2002; Lord 2001; Nortier 2000). In order to document the safety and efficacy of medical herbs for the treatment of mumps, it is necessary to systematically review the existing evidence. This review examined the existing evidence of the benefits and risks of Chinese medicinal herbs for treating people with mumps.

OBJECTIVES

To evaluate the effectiveness and safety of Chinese medicinal herbs combined with routine treatments for mumps.

METHODS

Criteria for considering studies for this review

Types of studies

Randomised controlled trials (RCTs).

Types of participants

We included adults and children (any age) diagnosed with mumps by positive signs and symptoms or with laboratory evidence (isolation of the mumps virus, detection of viral nucleic acid, or serodiagnosis). The diagnosis of mumps was made on the basis of TCM diagnostic criteria (Jiang 1994), issued by the State Administration of Traditional Chinese Medicine standards. TCM diagnostic criteria for mumps include a history of exposure to mumps and symptoms beginning with fever and then swelling of the parotid glands, which may be unilateral (one side) or bilateral (both sides). The parotid glands are located in front of the ear, indistinctly outlined, elastic to palpation, painful and tender, with swelling of the parotid gland orifices. The white blood cell count is normal or slightly low and the lymphocyte count is slightly increased.

We also included mumps cases with complications such as epididymo-orchitis, meningitis, encephalitis, pancreatitis, oophoritis, mastitis, spontaneous miscarriage, arthritis, nephritis, thyroiditis, myocarditis, hepatitis, acalculous cholecystitis, kerato-uveitis, haemophagocytic syndrome, thrombocytopenia, and diabetes mellitus. We established the diagnostic criteria at the beginning of the trial and any changes in the diagnostic criteria that might result in variability in the clinical features of the participants included and the result obtained. We considered, documented, and explored these differences in a sensitivity analysis. We excluded patients concurrently suffering from other infections (for example, common cold, rotavirus enteritis, or bacterial infection).

Types of interventions

1. Chinese medicinal herbs with or without other routine treatments compared with placebo, no treatment, or other routine care.
2. Chinese medicinal herbs administered by any route.

Types of outcome measures

Primary outcomes

1. Mortality caused by secondary complications during treatment.

Secondary outcomes

1. The duration of mumps symptoms. Common symptoms include fever, pain with chewing or swallowing, weakness and fatigue, painful or swollen salivary glands, swollen testicles, neck stiffness, headache, and loss of appetite. Less common symptoms include permanent deafness, pancreatitis, oophoritis, mastitis, arthritis, nephritis, thyroiditis, myocarditis, meningitis, hepatitis, acalculous cholecystitis, kerato-uveitis, haemophagocytic syndrome, thrombocytopenia, and diabetes mellitus.
2. Changes in TCM signs and symptoms, which are investigated, for example, by examining the participant's tongue and pulses.
3. Adverse events. Serious adverse events include mortality, hospitalisation, significant or permanent disability, congenital anomalies, and any event requiring medical intervention to prevent permanent impairment or damage. Other adverse events include headache, rash, nausea, pyrexia, non-specific dyspnoea, vomiting, hypertension, worsening of condition, and non-specific pruritus.

Search methods for identification of studies

Electronic searches

For this update we searched the Cochrane Central Register of Controlled Trials (CENTRAL 2015, Issue 1) (accessed 4 February 2015), which includes the Cochrane Acute Respiratory Infections Group's Specialised Register, MEDLINE (March 2012 to January week 4, 2015), EMBASE (March 2012 to February 2015), CINAHL (March 2012 to February 2015), AMED (2012 to April 2014), the Chinese Biomedical Database (CBM) (1980 to February 2015), China National Knowledge Infrastructure (CNKI) (1979 to February 2015), and VIP Information (1989 to February 2015).

Previously we searched the Cochrane Central Register of Controlled Trials (CENTRAL 2012, Issue 4) (accessed 26 April 2012), which includes the Cochrane Acute Respiratory Infections Group's Specialised Register, MEDLINE (1948 to April week 3, 2012), EMBASE (1974 to April 2012), CINAHL (1981 to April 2012), AMED (1985 to April 2012), the Chinese Biomedical Database (CBM) (1980 to May 2012), China National Knowledge Infrastructure (CNKI) (1979 to May 2012), and VIP Information (1989 to May 2012).

We used the search strategy described in Appendix 1 to search MEDLINE and CENTRAL. We did not use a filter to identify RCTs as there were too few results. We adapted the search strategy to search EMBASE (Appendix 2), CINAHL (Appendix 3), AMED (Appendix 4), VIP (Appendix 5), CNKI (Appendix 6), and CBM (Appendix 7). We imposed no language or publication restrictions.

Searching other resources

We searched relevant reference lists of all relevant trials, reviews, conference proceedings, and journals. We contacted organisations (including the World Health Organization (WHO)), experts working in the field, and medical herb manufacturers to obtain information about unpublished or incomplete trials, confidential reports, and raw data from published trials. In addition, we searched

the trials registries for completed and ongoing trials (last searched 4 February 2015): World Health Organization (WHO) International Clinical Trials Registry Platform (ICTRP) search portal, ClinicalTrials.gov, and the Chinese Clinical Trial Registry.

Data collection and analysis

Selection of studies

Two review authors (MS, YW) independently conducted the initial review, applied the inclusion criteria, and reviewed titles and abstracts from the search results. They identified the authenticity of each reported RCT by telephone interviews with the trial authors. We resolved disagreements by discussion with a third review author (YQZ). We excluded trials that were not counted as true RCTs and the reasons are listed in the [Characteristics of excluded studies](#) table. There was no inconsistency in the selection of studies.

Data extraction and management

Two review authors (MS, YW) independently conducted data extraction using a standard data extraction sheet. We resolved disagreements through consultation with a third review author (YQZ). We obtained and included in the review any missing data by contacting the trial author. One review author (YW) independently reviewed all data extracted from the original articles to confirm the quality of methods and analysis used. We included the following items on our data extraction sheet.

1. General information: study ID, author, title, published or unpublished, reference or source, contact address, country, language of publication, publication year, duplicate publications, funding, and setting.
2. Trial characteristics: design, method of randomisation, allocation concealment, blinding (participants, people administering treatment, outcome assessors), and duration of follow-up.
3. Intervention(s): dose, route and timing, names of single medicine or compounds (including any possible specific data of the essential herbs in a compound), and use of placebo.
4. Participants: age (children/adults), total number and number in comparison groups, baseline characteristics, similarity of groups at baseline (including any co-morbidity), diagnostic criteria, exclusion criteria, assessment of compliance, withdrawals, losses to follow-up (reasons/description), and subgroups.
5. Outcomes: outcomes specified above, any other outcomes assessed, and quality of reporting of outcomes.

We extracted the number of events and total number in each group for binary outcomes. We extracted the mean standard deviation and sample size of each group for continuous outcomes.

Assessment of risk of bias in included studies

Two review authors (MS, YW) independently assessed the methodological quality of studies to be included. We resolved disagreements by discussion with another review author (YQZ). The specific methodological quality items to be assessed were randomisation, allocation concealment, blinding, treatment adherence, percentage of participation, and comparability of groups on baseline characteristics. According to empirical evidence ([Higgins 2011](#); [Juni 2001](#); [Kjaergard 2001](#); [Moher 2001](#); [Schulz 1995](#);

[Wu 2007](#)), we assessed the methodological quality of each trial as described by [Kjaergard 2001](#), [Wu 2007](#), and [Higgins 2011](#).

1. Generation of allocation sequence: adequate (computer-generated random numbers, random number table, or similar); inadequate (other methods or not described); or unclear.
2. Allocation concealment: adequate (central allocation, sealed envelopes, or similar); inadequate (not described or open random allocation schedule or similar); or unclear.
3. Blinding: low risk (the outcome assessors were blinded); high risk (no blinding was performed); unclear.
4. Incomplete outcome data (checking for possible attrition bias through withdrawals, drop-outs, protocol deviations): low risk (few drop-outs/losses to follow-up are noted and an intention-to-treat (ITT) analysis is possible); high risk (the rate of exclusion was at least 20%, or wide differences in exclusions between groups whatever ITT analysis was performed); or unclear.
5. Selective reporting bias: low risk (all of the trial's prespecified outcomes and all expected outcomes of interest to the review have been reported clearly); high risk (not all the trial's prespecified outcomes have been reported; one or more reported primary outcomes were not prespecified; outcomes of interest are reported incompletely; study fails to include results of a key outcome that would have been expected to have been reported); or unclear.
6. Other sources of bias: we assessed whether each trial was free of other problems that could put it at risk of bias.

We planned to integrate this assessment into the interpretation of results by carrying out sensitivity analyses and excluding poor quality studies.

Measures of treatment effect

In future we will express dichotomous outcomes as a risk ratio (RR) with 95% confidence intervals (CIs). We will express continuous variables as a mean difference (MD) if reported on the same scale or as a standardised mean difference (SMD) if reported using different continuous scales, with 95% CIs.

Unit of analysis issues

We will analyse data using Review Manager ([RevMan 2014](#)). For binary data we will compare outcome measures using a risk ratio (RR). For continuous data, we will use the MD. If continuous data are reported using geometric means, we plan to combine the findings on a log scale and report on the original scale.

Dealing with missing data

If a marked drop-out of participants is noted, we will undertake an intention-to-treat (ITT) analysis. Where data are missing, we will try to contact the trial authors. We will analyse the available data and discuss the impact of the missing data on our results.

Assessment of heterogeneity

We will measure heterogeneity by using the I^2 statistic ([Higgins 2011](#)), which will assess the significance of any differences between trials (P value ≤ 0.05). Where we do not detect heterogeneity, we will perform a fixed-effect meta-analysis. Where substantial heterogeneity (I^2 statistic above 50%) is present, we will consider possible interpretations for this and, where applicable, use a

random-effects model and consider not combining the results, but instead present a descriptive analysis.

Assessment of reporting biases

We will evaluate reporting biases using funnel plots in future updates where we have sufficient trials and consider causes for asymmetry if it is marked.

Data synthesis

We will address the meta-analysis method, including whether to use a fixed-effect or random-effects model. If we do not undertake a meta-analysis, we will describe systematic approaches to synthesising the findings from multiple studies ([Higgins 2011](#)).

Subgroup analysis and investigation of heterogeneity

If we identify a sufficient number of studies, we will perform subgroup analyses to explore effect size differences by group and heterogeneity found in the primary analyses. We will consider subgroup analyses for the following areas.

1. Children/adults.
2. Different formulations.

3. Different administration routes (external, oral, or intravenous).
4. Doses (low and high, based on data).
5. Type of control - placebo/standard clinical care.

Sensitivity analysis

We plan to perform a sensitivity analysis by removing single trials to investigate the extent to which they contribute to heterogeneity, paying close attention to baseline characteristics.

RESULTS

Description of studies

See: [Characteristics of excluded studies](#); [Characteristics of studies awaiting classification](#).

Results of the search

We identified 108 trials of Chinese medicinal herbs with or without other routine treatments compared with placebo, no treatment, or other routine care, which mentioned random allocation. We contacted the original trial authors to ascertain whether their method was truly randomised or not. We successfully contacted 104 authors ([Figure 1](#)).

Figure 1. Study flow diagram.

Included studies

We did not identify any eligible trials for inclusion.

Excluded studies

We excluded a total of 104 studies. We excluded 93 due to inadequate random allocation (Bai 2002; Bi 1996; Cai 1998; Chao 2002; Chen 1997; Chen 2006; Cheng 2002; Dai 1999; Dong 2009; Fan 2003; Fei 1996; Fu 2002; Gao 2006; Gong 2010; Gu 2008; Guo 2006;

Hu 2005; Hu 2006; Huang 1999; Jiang 2006; Li 1998; Li 2002a; Li 2002b; Li 2003; Li 2005; Li 2006a; Li 2006b; Li 2008; Liu 2001; Liu 2002; Liu 2007; Lv 2000; Ma 2014; Pan 2009; Qian 2009; Sheng 2005; Shi 2005; Shi 2006; Shi 2010; Shu 2003; Song 1999; Song 2000; Song 2003; Su 2006; Sun 2005; Sun 2012; Tang 1996; Ten 2002; Teng 2005; Tu 2001; Wang 1999; Wang 2001; Wang 2002a; Wang 2002b; Wang 2003; Wang 2006; Wang 2014; Wei 2006; Wu 1997; Wu 2001; Wu 2005a; Wu 2005b; Wu 2010; Xia 2000; Xu 1998; Xu 2000; Xu 2003a; Xu 2003b; Xu 2006; Xue 2000; Yang 2002; Yang 2003; Yin 2004a; Yin 2004b; Yue 2006; Zhang 1996; Zhang 1998; Zhang 2001a; Zhang 2001b; Zhang 2001c; Zhang 2002a; Zhang 2002b; Zhang 2003a; Zhang 2003b; Zhang 2009; Zhao 2002; Zhao 2008; Zhao 2009a; Zhao 2009b; Zhao 2013; Zhou 2000; Zhu 2001; Zhu 2002). We excluded 11 studies because allocation was according to the patient's number of admittance, making it a quasi-RCT (Bai 2012; Fan 1999; Lv 2009; Nong 2010; Sun 2007; Tang 2003; Xin 2005; Yin 2006; Zhang 2002c; Zhao 2006; Zhou 2006). We were unable to contact the trial authors of four studies (Chen 2013; Wang 2002; Yan 1998; Zhang 1997); these trials require further assessment and have been allocated to the [Characteristics of studies awaiting classification](#) section.

Risk of bias in included studies

We did not identify any studies that met our inclusion criteria for this review. We could not make any risk of bias assessments.

Effects of interventions

Owing to no eligible randomised controlled trials (RCTs), it was not possible to perform any analyses.

DISCUSSION

Summary of main results

We have no data to report.

Overall completeness and applicability of evidence

Although herbal medicines are widely used to treat mumps in China and many clinical studies of Chinese medicinal herbs for mumps have been performed and published, we were unable to identify any true randomised controlled trials (RCTs). We hope more high-quality RCTs will be conducted in the future.

Quality of the evidence

The results of the telephone interviews confirmed that the design of the studies we identified was not randomised, even though all of them mentioned randomisation. Some studies allocated participants voluntarily. Other studies allocated participants according to the participants' admission sequence, making it a pseudo-random allocation. None of the trials concealed participants' allocation or used blinding methods.

Potential biases in the review process

All of the studies related to our question might be affected by selection bias, performance bias, and detection bias due to lack of allocation concealment and blinding.

Chinese medicinal herbs usually differ from Western medicines in terms of appearance, taste, and smell. Therefore, it was difficult to

use blinding. However, a double-dummy technique could be used and the outcome assessors could be blinded.

Publication bias might exist as all of the studies were published in China and no primary articles reported negative results.

An additional problem was that most Chinese medicinal herbs were prepared by either the trial authors or colleagues in their hospital. There could be a high risk of conflict of interest, which may influence the reliability of the results. Furthermore, most Chinese medicinal herbs were tested in one study only and most of the trials were performed in country hospitals or smaller clinics. This means that most of the trials did not receive ethical approval and therefore may not be true trials but case series.

Agreements and disagreements with other studies or reviews

We did not identify any trials eligible for inclusion.

AUTHORS' CONCLUSIONS

Implications for practice

We did not find any randomised controlled trials (RCTs) for or against Chinese herbal medicine used to treat mumps.

Implications for research

There is a widespread belief among Chinese physicians and patients that Chinese medicinal herbs are effective in alleviating symptoms and reducing the duration of mumps. Owing to the absence of RCTs in this field, we are unable to draw a conclusion about whether Chinese medicinal herbs are effective and safe in treating mumps. Well-designed, adequately powered RCTs should be conducted to evaluate Chinese herbs for mumps. Attention should also be paid to the incidence of adverse events in all future trial reports, which would provide important information for physicians.

When a trial uses a self prepared herbal formulation, the quality of the Chinese medicinal herbs and methods of preparation should be stated in detail, in order to achieve consistent effects.

For many Chinese researchers, allocation concealment should be emphasised and the approaches should be clearly described. The randomisation procedure should also be clearly reported. Blinding should be used in further studies of Chinese medicinal herbs, though it may be difficult.

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REFERENCES

References to studies excluded from this review

Bai 2002 {published data only}

Bai F, Hu Y. Yinqiaotangjiajian for epidemic parotitis. *Journal of Medical Theory and Practice* 2002;**15**(2):183-4.

Bai 2012 {published data only}

Bai SQ. Combination of oral and skin administration of herbal medicine for mumps: a study of 40 cases. *Chinese Pediatrics of Integrated Traditional and Western Medicine* 2012;**4**(3):267-9.

Bi 1996 {published data only}

Bi MH. External application of Scorpion and dipyrindamole in the treatment of 46 cases of epidemic parotitis. *Chinese Journal of Integrative Medicine* 1996;**16**(6):384.

Cai 1998 {published data only}

Cai YJ. Observation of curative effect on external application of Chinese medicinal herbs in the treatment of epidemic parotitis. *The Practical Journal of Integrating Chinese with Modern Medicine* 1998;**11**(11):989.

Chao 2002 {published data only}

Chao DQ, Wang LX, Zheng YF. Clinical observation on external application of Chinese medicinal herbs in the treatment of 35 cases of epidemic parotitis. *Modern Journal of Integrated Traditional and Western Medicine* 2002;**11**(5):411.

Chen 1997 {published data only}

Chen FL, Chen J. External application of Chinese medicinal herbs in the treatment of 46 cases of epidemic parotitis. *Intermediate Medical Journal* 1997;**32**(11):700.

Chen 2006 {published data only}

Chen AQ. Clinical observation on treating 50 cases of angina parotidea by integration of acupuncture and drug. *Guiding Journal of TCM* 2006;**12**(6):34-5.

Cheng 2002 {published data only}

Cheng H, Shen M, Lu SX, EH. External application of Furong ointment in the treatment of 116 cases of epidemic parotitis. *Chinese Journal of Information on Traditional Chinese Medicine* 2002;**9**(11):53-4.

Dai 1999 {published data only}

Dai ZZ. Shuang Huang Lian in the treatment of 128 cases of epidemic parotitis. *Herald of Medicine* 1999;**18**(1):42.

Dong 2009 {published data only}

Dong L. Therapeutic observation on treatment of infantile epidemic parotitis with Chaihu Gegen Decoction. *International Journal of Traditional Chinese Medicine* 2009;**31**(6):523.

Fan 1999 {published data only}

Fan DY. Jideshengsheyao tablet in the treatment of 42 cases of epidemic parotitis. *Chinese Community Doctors* 1999;**15**(4):34-5.

Fan 2003 {published data only}

Fan L. Effects of Xiaoyanzhitong ointment on child epidemic mumps. *Journal of Chinese Clinical Medicine and Pharmacy (Beijing)* 2003;**4**(16):48.

Fei 1996 {published data only}

Fei LM. Observation of curative effect on Shuang Huang Lian Zhu She Ji in the treatment of epidemic parotitis. *Practical Journal of Integrated Traditional and Western Medicine in Clinical Emergency* 1996;**3**(10):460-1.

Fu 2002 {published data only}

Fu P. Effects of Chuanhuning on epidemic parotitis: 32 cases. *Jiangxi Journal of Traditional Chinese Medicine* 2002;**33**(4):29-30.

Gao 2006 {published data only}

Gao Q. Observation of effect of Yanhuning on child epidemic parotitis. *Chinese Rural Health Service* 2006;**26**(9):61-2.

Gong 2010 {published data only}

Gong XQ, Kang Y. Observation of curative effect on Reduning combined with external application of Chinese medicinal herbs in the treatment of epidemic parotitis. *Chinese Journal of Ethnomedicine and Ethnopharmacy* 2010;**4**:130-1.

Gu 2008 {published data only}

Gu HP. External application of Chinese medicinal herbs in the treatment of 62 cases of epidemic parotitis. *Journal of Hebei North University (Medical Edition)* 2008;**25**(4):61-2.

Guo 2006 {published data only}

Guo F. Clinical observation of Shuanghuanglian injection for epidemic parotitis. *Practical Clinical Medicine* 2006;**7**(7):146.

Hu 2005 {published data only}

Hu S. Effects of Tanreqing injection on epidemic mumps. *Journal of Chinese Clinical Medicine* 2005;**6**(5):90.

Hu 2006 {published data only}

Hu BZ, Li HY. Qinlian mint soup combined with external application of Zhu huang powder in the treatment of epidemic parotitis. *Zhejiang Journal of Integrated Traditional Chinese and Western Medicine* 2006;**16**(2):114-5.

Huang 1999 {published data only}

Huang TH, Zhang TS. Observation of curative effect on integrated traditional and Western medicine in the treatment of 91 cases of epidemic parotitis. *Practical Journal of Integrated Traditional and Western Medicine in Clinical Emergency* 1999;**6**(6):260.

Jiang 2006 {published data only}

Jiang J, Sun P. Observation of external use of Zhitongxiaoyan ointment for epidemic parotitis. *Zhejiang Journal of Integrated Traditional Chinese and Western Medicine* 2006;**16**(8):523.

Li 1998 {published data only}

Li SH, Wang EC. Integrated traditional and Western medicine in the treatment of 207 cases of epidemic parotitis. *Shaanxi Traditional Chinese Medicine* 1998;**19**(8):348.

Li 2002a {published data only}

Li W, Li X. External application of Xiaozhatie in the treatment of 102 cases of epidemic parotitis. *Journal of New Chinese Medicine* 2002;**34**(12):54.

Li 2002b {published data only}

Li L, Li P, Wang Y, Liu K. Qingkailing and interferon- α 2b for epidemic mumps. *Journal of Chinese Clinical Medicine and Pharmacy (Beijing)* 2002;**18**(3):72-3.

Li 2003 {published data only}

Li C, Pang X, Wang H. Observation of effects of Qingkailing on epidemic parotitis. *Modern Journal of Integrated Traditional Chinese and Western Medicine* 2003;**12**(13):1400.

Li 2005 {published data only}

Li B, Liu Y. Effects of Fufangdaqingye with cactus on epidemic mumps. *Journal of Community Medicine* 2005;**3**(4):45-6.

Li 2006a {published data only}

Li XY. External application of Chinese medicinal herbs in the treatment of 66 cases of epidemic parotitis. *Yunnan Journal of Traditional Chinese Medicine and Materia Medica* 2006;**27**(3):18.

Li 2006b {published data only}

Li J, Wang X. Effect of Lepingqingzhenhuangwan on childhood epidemic mumps. *Chinese Community Doctors* 2006;**22**(13):48-9.

Li 2008 {published data only}

Li Y. Effect of integrated traditional and Western medicine on epidemic parotitis complicated by orchitis. *Jilin Journal of Traditional Chinese Medicine* 2008;**28**(11):799-800.

Liu 2001 {published data only}

Liu T, Ding Q. Clinical observation of external use of Zhitongxiaoyan ointment for epidemic parotitis: 116 cases. *Medical Journal of Industrial Enterprise* 2001;**14**(4):59.

Liu 2002 {published data only}

Liu B, Li R. Chuanhuning injection for epidemic mumps: 36 cases. *Chinese Journal of Synthetic Medicine* 2002;**3**(5):469.

Liu 2007 {published data only}

Liu H, Zhang G. Clinical controlled study of internal and external use of Xianfanghuomingyin and Zijinding for epidemic mumps. *Modern Medicine Journal of China* 2007;**9**(6):90-1.

Lv 2000 {published data only}

Lv HF, Jang RL. Qingkailing Injection in the treatment of 32 cases of epidemic parotitis. *Shandong Medicine* 2000;**40**(1):57.

Lv 2009 {published data only}

Lv X, Meng L, Wu L. The clinical treatment scheme optimization study of epidemic parotitis. *Journal of Pediatrics of Traditional Chinese Medicine* 2009;**5**(6):10-3.

Ma 2014 {published data only}

Ma XZ. An investigation of antivirus capsule together with ribavirin for the treatment of epidemic parotitis in children. *Chinese and Foreign Medical Research* 2014;**12**(3):35-6.

Nong 2010 {published data only}

Nong Z, Lan R. Effects of Pujixiaoduyinheqingdai on epidemic mumps. *Journal of Guangxi Traditional Chinese Medical University* 2010;**13**(2):15-6.

Pan 2009 {published data only}

Pan S, Zhang H, Yi L, Mei X. Effect of Tanreqing injection on epidemic mumps complicated by meningoencephalitis. *Chinese Journal of Primary Medicine and Pharmacy* 2009;**15**(6):1116-7.

Qian 2009 {published data only}

Qian X. Observation of effects of external use of cactus with egg white on epidemic mumps. *Modern Clinical Nursing* 2009;**8**(2):55-6.

Sheng 2005 {published data only}

Sheng Z. Observation of Shuanghuanglian for epidemic mumps: 70 cases. *Chinese Journal of Medicine Guide* 2005;**3**(7):843-4.

Shi 2005 {published data only}

Shi CX, Gao YX. A clinical analysis of Tanreqing injection in the treatment of 82 cases of epidemic parotitis complicated with meningitis. *Shandong Medical Journal* 2005;**45**(7):35-6.

Shi 2006 {published data only}

Shi DG, Zhang Q, Luan FQ. Electric superconducting transdermal delivery with Chinese medicinal herbs in the treatment of epidemic parotitis. *Journal of External Therapy of TCM* 2006;**15**(3):30-1.

Shi 2010 {published data only}

Shi L. Jidesheng snake tablets for epidemic mumps: 65 cases. *Yunnan Journal of Traditional Chinese Medicine and Materia Medica* 2010;**21**(2):37.

Shu 2003 {published data only}

Shu YP. TCM treatment of mumps. *Journal of Sichuan of Traditional Chinese Medicine* 2003;**21**(6):59-60.

Song 1999 {published data only}

Song SP, Duan HZ, Niu Y. Qingkailing injection in the treatment of 80 cases of epidemic parotitis. *Yunnan Journal of Traditional Chinese Medicine and Materia Medica* 1999;**20**(5):32-3.

Song 2000 {published data only}

Song F. External use of Hibiscus leaves and Cactus for epidemic mumps: 30 cases. *China's Naturopathy* 2000;**8**(7):25.

Song 2003 {published data only}

Song J, Song Y. Qingkailing for epidemic mumps complicated meningitis: 25 cases. *Shaanxi Journal of Traditional Chinese Medicine* 2003;**24**(3):235-6.

Su 2006 {published data only}

Su Y, Yang Y. Clinical observation of Tanreqing for epidemic mumps. *Central Plains Medical Journal* 2006;**33**(16):80-1.

Sun 2005 {published data only}

Sun HL, Sun HR. Observation of curative effect on Liushen pill in the treatment of epidemic parotitis. *Journal of Pediatric Pharmacy* 2005;**11**(4):52.

Sun 2007 {published data only}

Sun G, Zhang Y. Tanreqing Injection in the treatment of 22 cases of epidemic parotitis. *China's Naturopathy* 2007;**15**(6):25.

Sun 2012 {published data only}

Sun HM, Wang S, Chen YQ, Zhang YH, Li J, Meng JM. The combined use of Tan Reqing and ganciclovir in 77 cases of mumps. *Internal Medicine of China* 2012;**7**(3):262-3.

Tang 1996 {published data only}

Tang YX, Zhou Q, Fang XM, Qin HZ. External application of Liushen pill, vinegar and zijinding in the treatment of epidemic parotitis. *Journal of Jinzhou Medical University* 1996;**17**(5):37-8, 43.

Tang 2003 {published data only}

Tang Y, Peng J. 64 cases of mumps treated with Andrographitis paniculata. *Chinese Journal of Clinical Medicine Research* 2003;**7**(9):12659.

Ten 2002 {published data only}

Ten XQ, Yu XB, Liu CH. Clinical observation on traditional Chinese medicine enema in the treatment of epidemic parotitis. *China's Naturopathy* 2002;**10**(3):35-6.

Teng 2005 {published data only}

Teng S, Sun H. External use of Xinhuang pills for epidemic mumps: 34 cases. *China's Naturopathy* 2005;**13**(2):45-6.

Tu 2001 {published data only}

Tu L. Effects of Qingkailing injection on epidemic mumps: 32 cases. *Journal of Jinggangshan Medical College* 2001;**8**(3):42.

Wang 1999 {published data only}

Wang DH, Ying FQ, Jiang ZB. Clinical observation on Sanhuang powder in the treatment of 98 cases of epidemic parotitis in children. *Heilongjiang Pharmaceutical Science* 1999;**22**(5):88.

Wang 2001 {published data only}

Wang H. Clinical observation on external application of Golden cream in the treatment of epidemic parotitis. *Journal of Tianjin College of Traditional Chinese Medicine* 2001;**20**(3):41.

Wang 2002a {published data only}

Wang R. Observation of effects of Chuanhuning on epidemic mumps. *Journal of Jinning Medical College* 2002;**25**(2):55.

Wang 2002b {published data only}

Wang J, Fu Y. Yinqiaotangjiajian for epidemic mumps: 28 cases. *Liaoning Journal of Traditional Chinese Medicine* 2002;**29**(6):390.

Wang 2003 {published data only}

Wang C, Zhang T, Sun T. Reports of external use of Baifanfuji for epidemic mumps: 108 cases. *Qinghai Medical Journal* 2003;**33**(10):51-2.

Wang 2006 {published data only}

Wang J. Effects of sodium new houttuyfonate injection on epidemic mumps. *Gansu Journal of Traditional Chinese Medicine* 2006;**19**(10):19.

Wang 2014 {published data only}

Wang F, Deng LN, Zhang BP, Shang H, Zhang GS, Yao ZY. The clinical observation of skin application of analgesic anti-inflammatory ointment for the treatment of mumps complicated orchitis. *Chinese Journal of Coal Industry Medicine* 2014;**17**(8):1309-11.

Wei 2006 {published data only}

Wei C. Observation of the curative effect of Yanhuning infantile mumps and its nursing care. *Modern Medicine & Health* 2006;**10**(19):2927-8.

Wu 1997 {published data only}

Wu XD. Clinical observation on Shuang Huang Lian Zhu She Ji in the treatment of epidemic parotitis. *Practical Journal of Integrated Traditional and Western Medicine in Clinical Emergency* 1997;**4**(8):363.

Wu 2001 {published data only}

Wu W, Ji X, Liu C. Effects of Chuanhuning on epidemic mumps: 50 cases. *LiShiZhen Medicine and Materia Medica Research* 2001;**12**(4):356.

Wu 2005a {published data only}

Wu H, Li J, Hua Y. Effects of Tanreqing on epidemic parotitis: 30 cases. *Chinese Journal of Current Clinical Medicine* 2005;**3**(23):2536.

Wu 2005b {published data only}

Wu K, Min G. Effects of Xiaoyanjiedu oral solution on epidemic parotitis: 46 cases. *Journal of Handan Medical College* 2005;**18**(2):108.

Wu 2010 {published data only}

Wu Z, Wu Q, Wu Y. Dujiagao for epidemic mumps: 42 cases. *Journal of Emergency in Traditional Chinese Medicine* 2010;**11**(5):870-1.

Xia 2000 {published data only}

Xia J. Effects of Pujixiaoduyin on epidemic mumps: 30 cases. *Jiangxi Journal of Traditional Chinese Medicine* 2000;**31**(3):31.

Xin 2005 {published data only}

Xin CS, Li M, Zhao LC, Liu G. Observation of curative effect on Tanreqing injection in the treatment of 34 cases of epidemic parotitis. *Chinese Remedies & Clinics* 2005;**5**(11):869-70.

Xu 1998 {published data only}

Xu J. Chinese medicinal herbs in the treatment of 86 cases of epidemic parotitis accompanied by high fever. *Chinese Medicine Science and Technology* 1998;**5**(3):192.

Xu 2000 {published data only}

Xu H, Zhu C. Yuxingcao injection for child epidemic mumps complicated with meningoencephalitis: 49 cases. *Journal of Emergency in Traditional Chinese Medicine* 2000;**9**(3):110.

Xu 2003a {published data only}

Xu A. Effects of Chuanhuning injection on epidemic parotitis. *Acta Academiae Medicinae Jiangxi* 2003;**43**(4):135.

Xu 2003b {published data only}

Xu G, Wang Z. Effects of Shuanghuanglian oral solution on epidemic mumps: 28 cases. *LiShiZhen Medicine and Materia Medica Research* 2003;**14**(8):462.

Xu 2006 {published data only}

Xu Y. Shuanghuanglian for child epidemic mumps: 86 cases. *China's Naturopathy* 2006;**14**(12):30.

Xue 2000 {published data only}

Xue H, Zhu P, Yan Y. Chuanhuning for epidemic parotitis: 36 cases. *The Journal of Medical Theory and Practice* 2000;**13**(10):618.

Yang 2002 {published data only}

Yang XF, Yang YJ, Xie LP. External application of Chinese medicinal herbs in the treatment of 28 cases of epidemic parotitis in children. *Hubei Journal of Traditional Chinese Medicine* 2002;**24**(11):11-2.

Yang 2003 {published data only}

Yang LM. Electric superconducting transdermal delivery with Chinese medicinal herbs in the treatment of epidemic parotitis. *Chinese Journal of Physical Medicine and Rehabilitation* 2003;**25**(5):259.

Yin 2004a {published data only}

Yin YB. Clinical observation on anti-virus Ansai decoction in the treatment of 82 cases of epidemic parotitis. *Hunan Guiding Journal of TCM* 2004;**10**(10):13-4.

Yin 2004b {published data only}

Yin X. Effects of Qingkailing on epidemic parotitis: 45 cases. *Chinese Medical Journal of Communications* 2004;**18**(5):557.

Yin 2006 {published data only}

Yin W, Zhu Y, Xia J. Clinical studies on treating epidemic parotitis with Raduqing pills. *Journal of Yunnan University of Traditional Chinese Medicine* 2006;**29**(1):34-5.

Yue 2006 {published data only}

Yue C, Xu Z, Liu L. Clinical observation of Qingkailing injection for epidemic parotitis. *Journal of Emergency in Traditional Chinese Medicine* 2006;**15**(2):156-7.

Zhang 1996 {published data only}

Zhang ZW, Huang BQ. Observation of curative effect on external application of Qinbai powder combined with ribavirin in the treatment of 48 cases of epidemic parotitis. *Shenyang Army Medical* 1996;**9**(2):110.

Zhang 1998 {published data only}

Zhang GC, Hu J. External application of Xiaozhatie in the treatment of 52 cases of epidemic parotitis. *New Chinese Medicine* 1998;**30**(10):46.

Zhang 2001a {published data only}

Zhang G, Guo S, Jiang Y, Xiang Y. Observation of Chuanhuning for epidemic mumps: 48 cases. *Modern Journal of Integrated Chinese Traditional and Western Medicine* 2001;**18**(10):1775.

Zhang 2001b {published data only}

Zhang J, Dong Y. Zedoray turmeric oil and glucose injection for epidemic mumps complicated with meningoencephalitis: 38 cases. *Henan Journal of Practical Nervous Diseases* 2001;**4**(4):60.

Zhang 2001c {published data only}

Zhang Y, Su L, Su L. Effects of integrated Chinese traditional and Western medicine on epidemic mumps: 136 cases. *Journal of Yunnan College of Traditional Chinese Medicine* 2001;**24**(1):32.

Zhang 2002a {published data only}

Zhang JY. Observation of curative effect on Houuttuynia cordata injection in the treatment of 60 cases of epidemic parotitis. *Henan Medical Information* 2002;**10**(15):48-9.

Zhang 2002b {published data only}

Zhang Y. External use of Ruyihuangjinsan for epidemic mumps. *Henan Traditional Chinese Medicine* 2002;**22**(5):64.

Zhang 2002c {published data only}

Zhang M. Zedoray turmeric oil for epidemic mumps complicated with encephalitis. *Zhejiang Journal of Integrated Traditional Chinese and Western Medicine* 2002;**12**(4):252.

Zhang 2003a {published data only}

Zhang SY. Decoction combined with external application of Chinese medicinal herbs in the treatment of 34 cases of epidemic parotitis. *Modern Journal of Integrated Traditional Chinese and Western Medicine* 2003;**12**(20):2172.

Zhang 2003b {published data only}

Zhang DH. Self-made prescription of oral administration and external application in the treatment of 150 cases of epidemic parotitis. *Clinical Journal of Anhui traditional Chinese Medicine* 2003;**15**(3):225.

Zhang 2009 {published data only}

Zhang L. External use of Cactus and Tudahuang powder for epidemic mumps. *China's Naturopathy* 2009;**17**(7):20.

Zhao 2002 {published data only}

Zhao S, Dong J. Effects of Shuanghuanglian on epidemic mumps: 121 cases. *Journal of Hebei Traditional Chinese Medicine and Pharmacology* 2002;**17**(3):14.

Zhao 2006 {published data only}

Zhao Y. Observation of curative effect on Shuang Huang Lian Zhu She Ji combined with external application of natural indigo in the treatment of 49 cases of epidemic parotitis in children. *Chinese Journal of Misdiagnostics* 2006;**6**(7):1290-1.

Zhao 2008 {published data only}

Zhao X. Effect of integrated traditional and Western medicine on child epidemic parotitis. *Journal of Henan University of Chinese Medicine* 2008;**23**(6):66-7.

Zhao 2009a {published data only}

Zhao M, Wang HF, Ma HC. Ban Lan Gen Chong Ji combined with external application of Chinese medicinal herbs in the treatment of 36 cases of epidemic parotitis in children. *Hebi Journal TCM* 2009;**31**(9):1313-4.

Zhao 2009b {published data only}

Zhao Y, Wang Q, Wang T. Effects of Xiyanping combined with cataract on epidemic mumps: 25 cases. *China Tropical Medicine* 2009;**9**(7):1265.

Zhao 2013 {published data only}

Zhao J. Combination of intravenous infusion of Re Duning and skin application of aloe vera for mumps. *Nei Mongol Journal of Traditional Chinese Medicine* 2013;**32**(35):24-5.

Zhou 2000 {published data only}

Zhou MK, Zhou SL, Luan CJ. External application of Quzaling ointment in the treatment of 102 cases of epidemic parotitis. *New Chinese Medicine* 2000;**32**(1):47.

Zhou 2006 {published data only}

Zhou W. Clinical observation of effects of Xinhuang tablets on child epidemic mumps. *Journal of Clinical and Experimental Medicine* 2006;**5**(10):1619.

Zhu 2001 {published data only}

Zhu W, Wang G. Yuxingcao for child epidemic mumps complicated with meningoencephalitis: 30 cases. *Modern Medicine Health* 2001;**17**(2):157.

Zhu 2002 {published data only}

Zhu L, Huang C. Effects of Zedoray turmeric oil on child epidemic mumps. *Journal of Pediatric Pharmacy* 2002;**8**(1):25-6.

References to studies awaiting assessment
Chen 2013 {published data only}

Chen XJ, Lv CJ. Xiao Chaihu Tang for mumps: a study of 32 cases. *Modern Traditional Chinese Medicine* 2013;**33**(3):54, 63.

Wang 2002 {published data only}

Wang C. Yuxingcao injection and ribavirin for child epidemic mumps: a randomized controlled study. *Chinese Journal of Pharmacoeconomics* 2002;**11**(2):57-8.

Yan 1998 {published data only}

Yan DM, Zhang LJ. Qingkailing injection in the treatment of 68 cases of epidemic parotitis complicated with brain damage. *Journal of Emergency in Traditional Chinese Medicine* 1998;**7**(3):120.

Zhang 1997 {published data only}

Zhang PY, Xu X, Qu SQ. Qingkailing injection in the treatment of 26 cases of epidemic parotitis complicated with meningitis.

Journal of Emergency in Traditional Chinese Medicine 1997;**6**(4):160.

Additional references
Bajaj 2001

Bajaj NP, Rose P, Clifford-Jones R, Hughes PJ. Acute transverse myelitis and Guillain-Barre overlap syndrome with serological evidence for mumps viraemia. *Acta Neurologica Scandinavica* 2001;**104**(4):239-42. [PUBMED: 11589654]

Bertschat 1981

Bertschat FL, Alexander M. Infertility after mumps orchitis [Infertilitat nach Mumpssorchitis]. *Munchener Medizinische Wochenschrift* 1981;**123**(15):606-8. [PUBMED: 6785594]

Brent 2006

Brent AJ, Hull R, Jeffery KJ, Phillips RR, Atkins B. Acute cholecystitis complicating mumps. *Clinical Infectious Diseases* 2006;**42**(2):302-3. [PUBMED: 16355347]

Buyukavci 2005

Buyukavci M, Yildirim ZK, Tan H. High-dose IVIG therapy in a child with idiopathic thrombocytopenic purpura associated with mumps. *Journal of Pediatric Hematology/Oncology* 2005;**27**(1):56-7. [PUBMED: 15654282]

Caranasos 1967

Caranasos GJ, Felker JR. Mumps arthritis. *Archives of Internal Medicine* 1967;**119**(4):394-8. [PUBMED: 6022523]

CDC 2015

Centers for Disease Control and Prevention. Mumps cases and outbreaks. <http://www.cdc.gov/mumps/outbreaks.html/1397666354001-vaccine-8/outbreaks-sp.html> (accessed 2 February 2015) 2015.

Cheng 1999

Cheng GP, Liu MH. Controlled clinical trial of Curcuma oil in the treatment of mumps. *Chinese Journal of Pharmacoeconomics* 1999;**8**(4):203-4.

Deng 1998a

Deng W, Shi Gao. In: Wang Y, Deng W, Xue C editor(s). *Pharmacology and Applications of Chinese Materia Medica*. 2nd Edition. Beijing, China: People's Health Publishing House, 1998:282-6.

Deng 1998b

Deng W, Jin Ying Hua. In: Wang Y, Deng W, Xue C editor(s). *Pharmacology and Applications of Chinese Materia Medica*. 2nd Edition. Beijing, China: People's Health Publishing House, 1998:730-7.

Deng 1998c

Deng W, Ban Lan Gen. In: Wang Y, Deng W, Xue C editor(s). *Pharmacology and Applications of Chinese Materia Medica*. 2nd Edition. Beijing, China: People's Health Publishing House, 1998:636-41.

Erpenbach 1991

Erpenbach KH. Systemic treatment with interferon-alpha 2B: an effective method to prevent sterility after bilateral mumps orchitis. *Journal of Urology* 1991;**146**(1):54-6. [PUBMED: 2056606]

Everberg 1957

Everberg G. Deafness following mumps. *Acta Oto-Laryngologica* 1957;**48**(5-6):397-403. [PUBMED: 13508195]

Falk 1989

Falk WA, Buchan K, Dow M, Garson JZ, Hill E, Nosal M, et al. The epidemiology of mumps in southern Alberta 1980-1982. *American Journal of Epidemiology* 1989;**130**(4):736-49. [PUBMED: 2505612]

Galazka 1999

Galazka AM, Robertson SE, Kraigher A. Mumps and mumps vaccine: a global review. *Bulletin of the World Health Organization* 1999;**77**(1):3-14. [PUBMED: 10063655]

Goldacre 2005

Goldacre MJ, Wotton CJ, Yeates D, Seagroatt V, Neil A. Hospital admission for selected single virus infections prior to diabetes mellitus. *Diabetes Research and Clinical Practice* 2005;**69**(3):256-61. [PUBMED: 16098922]

Green 1964

Green GF. Mumps orchitis in childhood. *The Practitioner* 1964;**192**:550-2. [PUBMED: 14143332]

Gupta 2005

Gupta RK, Best J, MacMahon E. Mumps and the UK epidemic 2005. *BMJ (Clinical research ed.)* 2005;**330**(7500):1132-5. [PUBMED: 15891229]

Higgins 2011

Higgins JPT, Green S (editors). Cochrane Handbook for Systematic Reviews of Interventions Version 5.1.0 [updated March 2011]. The Cochrane Collaboration, 2011. Available from www.cochrane-handbook.org.

Hiraiwa 2005

Hiraiwa K, Obara K, Sato A. Mumps virus - associated hemophagocytic syndrome. *Emerging Infectious Diseases* 2005;**11**(2):343. [PUBMED: 15759337]

Huang 1990

Huang L, Ye WH. Primary research for pharmacology of compound Baikal Skullcap Root and the elements of it. *China Journal of Chinese Materia Medica* 1990;**15**(2):115.

Hughes 1966

Hughes WT, Steigman AJ, Delong HF. Some implications of fatal nephritis associated with mumps. *American Journal of Diseases of Children* 1966;**111**(3):297-301. [PUBMED: 5904470]

Hviid 2008

Hviid A, Rubin S, Muhlemann K. Mumps. *Lancet* 2008;**371**(9616):932-44. [PUBMED: 18342688]

Jiang 1994

Jiang YR, Sun H, Lin QL, YU JM, Zhu DN. TCM pediatric diagnostic efficacy standards. In: Chen YB editor(s). TCM Syndrome Diagnostic Efficacy Standards. Nanjing University Press, 1994:83.

Juni 2001

Juni P, Altman DG, Egger M. Systematic reviews in health care: assessing the quality of controlled clinical trials. *BMJ* 2001;**323**(7303):42-6.

Kjaergard 2001

Kjaergard LL, Villumsen J, Gluud C. Reported methodologic quality and discrepancies between large and small randomized trials in meta-analyses. *Annals of Internal Medicine* 2001;**135**(11):982-9.

Ku 1999

Ku JH, Kim YH, Jeon YS, Lee NK. The preventive effect of systemic treatment with interferon-alpha2B for infertility from mumps orchitis. *BJU International* 1999;**84**(7):839-42. [PUBMED: 10532982]

Lambert 1951

Lambert B. The frequency of mumps and of mumps orchitis and the consequences for sexuality and fertility. *Acta Genetica et Statistica Medica* 1951;**2** (Suppl 1):1-166. [PUBMED: 15444009]

Lampert 2002

Lampert N, Xu Y. Chinese herbal nephropathy. *Lancet* 2002;**359**(9308):796-7.

Lord 2001

Lord GM, Cook T, Arlt VM, Schmeiser HH, Williams G, Pusey CD. Urothelial malignant disease and Chinese herbal nephropathy. *Lancet* 2001;**358**(9292):1515-6.

Lu 1956

Lu SZ, Dai QL. Chinese herbal treatment for epidemic parotitis: a preliminary report. *Traditional Chinese Medicine* 1956;**6**(12):625.

Luo 2008

Luo HX. The curative effect of integrated traditional Chinese and Western medicines on epidemic parotitis in early stage. *Journal of Zhejiang University of Traditional Chinese Medicine* 2008;**32**(5):639-42.

Moher 2001

Moher D, Schulz KF, Altman D, CONSORT Group. The CONSORT Statement: revised recommendations for improving the quality of reports of parallel-group randomized trials. *JAMA* 2001;**285**(15):1987-91.

Morrison 1975

Morrison JC, Givens JR, Wiser WL, Fish SA. Mumps oophoritis: a cause of premature menopause. *Fertility and Sterility* 1975;**26**(7):655-9. [PUBMED: 1171028]

Nortier 2000

Nortier JL, Martinez MC, Schmeiser HH, Arlt VM, Bieler CA, Petein M, et al. Urothelial carcinoma associated with the use of a Chinese herb (*Aristolochia fangchi*). *New England Journal of Medicine* 2000;**342**(23):1686-92.

Onal 2005

Onal S, Tokar E. A rare ocular complication of mumps: kerato-uveitis. *Ocular Immunology and Inflammation* 2005;**13**(5):395-7. [PUBMED: 16419425]

Philip 1959

Philip RN, Reinhard KR, Lackman DB. Observations on a mumps epidemic in a virgin population. *American Journal of Hygiene* 1959;**69**(2):91-111. [PUBMED: 13626949]

Polat 2005

Polat A, Inan M, Cakaloz I, Karakus YT. A case of symptomatic idiopathic thrombocytopenic purpura during mumps. *Pediatric Hematology and Oncology* 2005;**22**(3):215-8. [PUBMED: 16020104]

RevMan 2014 [Computer program]

The Nordic Cochrane Centre, The Cochrane Collaboration. Review Manager (RevMan). Version 5.3. Copenhagen: The Nordic Cochrane Centre, The Cochrane Collaboration, 2014.

Schulz 1995

Schulz KF, Chalmers I, Hayes R, Altman D. Empirical evidence of bias. *JAMA* 1995;**273**(5):408-12.

Siegel 1966

Siegel M, Fuerst HT, Peress NS. Comparative fetal mortality in maternal virus diseases. A prospective study on rubella, measles, mumps, chicken pox and hepatitis. *New England Journal of Medicine* 1966;**274**(14):768-71. [PUBMED: 17926883]

Sonmez 2004

Sonmez FM, Odemis E, Ahmetoglu A, Ayvaz A. Brainstem encephalitis and acute disseminated encephalomyelitis following mumps. *Pediatric Neurology* 2004;**30**(2):132-4. [PUBMED: 14984908]

Sun 2004

Sun SL, Zhao JQ. The efficacy of Shuanghuanglian in treatment of child epidemic parotitis. *Journal of Pediatric Pharmacy* 2004;**10**(2):58-9.

TCM Discovery 2008

TCM Discovery. Mumps. http://tcmdiscovery.com/Sino-western-Joint/info/20081205_1754.html (accessed 31 July 2012) 2008.

TCM Discovery 2010

TCM Discovery. Science of Chinese materia medica. <http://tcmdiscovery.com/Chinese-Materia-Medica/> (accessed 31 July 2012) 2010.

Wang 1998

Wang BL, Liu ZJ, Fan YC. Jian Er Qing Jie decoction in the treatment of 31 children with upper respiratory infection. *Zhong Guo Xin Yao Za Zhi* 1998;**7**(3):218-9.

Werner 1950

Werner CA. Mumps orchitis and testicular atrophy; a factor in male sterility. *Annals of Internal Medicine* 1950;**32**(6):1075-86. [PUBMED: 15419601]

Wharton 2006

Wharton IP, Chaudhry AH, French ME. A case of mumps epididymitis. *Lancet* 2006;**367**(9511):702. [PUBMED: 16503474]

WHO 2014a

World Health Organization. Mumps. http://www.who.int/immunization/monitoring_surveillance/global_immunization_data.pdf (accessed 6 February 2015) 2014.

WHO 2014b

World Health Organization. Mumps reported cases. http://apps.who.int/immunization_monitoring/globalsummary/timeseries/tsincidenceumps.html (accessed 2 February 2015) 2014.

Wu 2007

Wu TX, Liu GJ. The concepts, design, practice and report of allocation concealment and blinding. *Chinese Journal of Evidence-Based Medicine* 2007;**7**(3):219-22.

References to other published versions of this review

Shu 2010

Shu M, Zhang YQ, Li Z, Liu GJ, Evertsen JM, Wan C. Chinese medicinal herbs for mumps. *Cochrane Database of Systematic Reviews* 2010, Issue 7. [DOI: [10.1002/14651858.CD008578](https://doi.org/10.1002/14651858.CD008578)]

Shu 2012

Shu M, Zhang YQ, Li Z, Liu GJ, Wan C. Chinese medicinal herbs for mumps. *Cochrane Database of Systematic Reviews* 2012, Issue 9. [DOI: [10.1002/14651858.CD008578.pub2](https://doi.org/10.1002/14651858.CD008578.pub2)]

CHARACTERISTICS OF STUDIES

Characteristics of excluded studies [ordered by study ID]

Study	Reason for exclusion
Bai 2002	"Randomised" was mentioned, but by telephone interviewing the trial author we discovered that the allocation method, which was described as "arbitrary and not strict", was not an adequate ran-

Chinese medicinal herbs for mumps (Review)

Study	Reason for exclusion
	domination approach. There was no random number table or other adequate randomisation and no protocol before the clinical trial
Bai 2012	"Randomised" was mentioned, but by telephone interviewing the trial author we discovered that the allocation method, which was described as "arbitrary and not strict", was not an adequate randomisation approach
Bi 1996	"Randomised" was mentioned, but by telephone interviewing the trial author we discovered that the allocation method, which was described as "voluntary", was not an adequate randomisation approach. The author knows that the method was incorrect
Cai 1998	"Randomised" was mentioned, but by telephone interviewing the trial author we discovered that the allocation method, which was described as "voluntary", was not an adequate randomisation approach
Chao 2002	"Randomised" was mentioned, but by telephone interviewing the trial author we discovered that the method of allocation, which had been described as "arbitrary and non-formal", was not an adequate randomisation approach
Chen 1997	"Randomised" was mentioned, but by telephone interviewing the trial author we understood that the allocation method, which was described as "arbitrary and not strict", was not an adequate randomisation approach
Chen 2006	"Randomised" was mentioned, but by telephone interviewing the trial author we discovered that the allocation method, which was described as "voluntary", was not an adequate randomisation approach. There was no random number table or other adequate randomisation and no protocol before the clinical trial
Cheng 2002	"Randomised" was mentioned, but by telephone interviewing the trial author we discovered that the allocation method, which was described as "voluntary", was not an adequate randomisation approach
Dai 1999	"Randomised" was mentioned, but by telephone interviewing the trial author we understood that the method of allocation was described as "arbitrary and subjective", but without any adequate random approach
Dong 2009	"Randomised" was mentioned, but by telephone interviewing the trial author we understood that the allocation method, which was described as "arbitrary and not strict", was not an adequate randomisation approach. There was no random number table or other adequate randomisation
Fan 1999	"Randomised" was mentioned, but by telephone interviewing the trial author we discovered that the method of allocation, which had been described as "according to the administration sequence", was not an adequate randomisation approach. There was no random number table or other adequate randomisation approach
Fan 2003	"Randomised" was mentioned, but by telephone interviewing the trial author we understood that the method of allocation was described as "arbitrary and subjective", but without any adequate random approach
Fei 1996	"Randomised" was mentioned, but by telephone interviewing the trial author we discovered that the allocation method, which was described as "arbitrary and not strict", was not an adequate randomisation approach. There was no random number table or other adequate randomisation and no protocol before the clinical trial
Fu 2002	"Randomised" was mentioned, but by telephone interviewing the trial author we discovered that the allocation method, which was described as "arbitrary", was not an adequate randomisation

Study	Reason for exclusion
	approach. There was no random number table or other adequate randomisation and no protocol before the clinical trial
Gao 2006	"Randomised" was mentioned, but by telephone interviewing the trial author we discovered that the method of allocation, which had been described as "arbitrary and non-formal", was not an adequate randomisation approach. There was no random number table or other adequate randomisation and no protocol before the clinical trial
Gong 2010	"Randomised" was mentioned, but by telephone interviewing the trial author we discovered that the allocation method, which was described as "arbitrary", was not an adequate randomisation approach. There was no random number table or other adequate randomisation and no protocol before the clinical trial
Gu 2008	"Randomised" was mentioned, but by telephone interviewing the trial author we discovered that the method of allocation, which had been described as "arbitrary and non-formal", was not an adequate randomisation approach. There was no random number table or other adequate randomisation and no protocol before the clinical trial
Guo 2006	"Randomised" was mentioned, but by telephone interviewing the trial author we discovered that the allocation method, which was described as "arbitrary and not strict", was not an adequate randomisation approach. There was no random number table or other adequate randomisation and no protocol before the clinical trial
Hu 2005	"Randomised" was mentioned, but by telephone interviewing the trial author we discovered that the method of allocation, which had been described as "arbitrary and non-formal", was not an adequate randomisation approach. There was no random number table or other adequate randomisation and no protocol before the clinical trial
Hu 2006	"Randomised" was mentioned, but by telephone interviewing the trial author we discovered that the allocation method, which was described as "voluntary", was not an adequate randomisation approach
Huang 1999	"Randomised" was mentioned, but by telephone interviewing the trial author we understood that the allocation method, which was described as "arbitrary and not strict", was not an adequate randomisation approach. There was no random number table or other adequate randomisation and no protocol before the clinical trial
Jiang 2006	"Randomised" was mentioned, but by telephone interviewing the trial author we discovered that the allocation method, which was described as "voluntary", was not an adequate randomisation approach
Li 1998	"Randomised" was mentioned, but by telephone interviewing the trial author we understood that the method of allocation, which was described as "arbitrary and subjective", was not an adequate randomisation approach
Li 2002a	"Randomised" was mentioned, but by telephone interviewing the trial author we discovered that the allocation method, which was described as "arbitrary and not strict", was not an adequate randomisation approach. There was no random number table or other adequate randomisation and no protocol before the clinical trial
Li 2002b	"Randomised" was mentioned, but by telephone interviewing the trial author we understood that the method of allocation, which was described as "arbitrary and subjective", was not an adequate randomisation approach. There was no random number table or other adequate randomisation and no protocol before the clinical trial

Study	Reason for exclusion
Li 2003	"Randomised" was mentioned, but by telephone interviewing the trial author we discovered that the allocation method, which was described as "voluntary", was not an adequate randomisation approach
Li 2005	"Randomised" was mentioned, but by telephone interviewing the trial author we discovered that the allocation method, which was described as "voluntary", was not an adequate randomisation approach
Li 2006a	"Randomised" was mentioned, but by telephone interviewing the trial author we understood that the method of allocation was described as "arbitrary and subjective", but without any adequate random approach. There was no random number table or other adequate randomisation and no protocol before the clinical trial
Li 2006b	"Randomised" was mentioned, but by telephone interviewing the trial author we discovered that the allocation method, which was described as "voluntary", was not an adequate randomisation approach
Li 2008	"Randomised" was mentioned, but by telephone interviewing the trial author we discovered that the allocation method, which was described as "arbitrary and not strict", was not an adequate randomisation approach. There was no random number table or other adequate randomisation and no protocol before the clinical trial
Liu 2001	"Randomised" was mentioned, but by telephone interviewing the trial author we discovered that the allocation method, which was described as "voluntary", was not an adequate randomisation approach
Liu 2002	"Randomised" was mentioned, but by telephone interviewing the trial author we understood that the method of allocation was described as "arbitrary and subjective", but without any adequate random approach
Liu 2007	"Randomised" was mentioned, but by telephone interviewing the trial author we discovered that the allocation method, which was described as "voluntary", was not an adequate randomisation approach
Lv 2000	"Randomised" was mentioned, but by telephone interviewing the trial author we understood that the method of allocation, which was described as "arbitrary and subjective", was not an adequate randomisation approach
Lv 2009	"Randomised" was mentioned, but by telephone interviewing the trial author we discovered that the method of allocation, which had been described as "according to the administration sequence", was not an adequate randomisation approach. There was no random number table or other adequate randomisation approach
Ma 2014	"Randomised" was mentioned, but by telephone interviewing the trial author we understood that the allocation method, which was described as "arbitrary and not strict", was not an adequate randomisation approach. There was no random number table or other adequate randomisation
Nong 2010	"Randomised" was mentioned, but by telephone interviewing the trial author we discovered that the method of allocation, which had been described as "according to the administration sequence", was not an adequate randomisation approach. There was no random number table or other adequate randomisation approach
Pan 2009	"Randomised" was mentioned, but by telephone interviewing the trial author we discovered that the allocation method, which was described as "arbitrary and not strict", was not an adequate randomisation approach. There was no random number table or other adequate randomisation and no protocol before the clinical trial

Study	Reason for exclusion
Qian 2009	"Randomised" was mentioned, but by telephone interviewing the trial author we discovered that the allocation method, which was described as "voluntary", was not an adequate randomisation approach. There was no random number table or other adequate randomisation and no protocol before the clinical trial
Sheng 2005	"Randomised" was mentioned, but by telephone interviewing the trial author we understood that the method of allocation, which was described as "arbitrary and subjective", was not an adequate randomisation approach
Shi 2005	"Randomised" was mentioned, but by telephone interviewing the trial author we discovered that the allocation method, which was described as "voluntary", was not an adequate randomisation approach
Shi 2006	"Randomised" was mentioned, but by telephone interviewing the trial author we understood that the method of allocation, which was described as "arbitrary and subjective", was not an adequate randomisation approach
Shi 2010	"Randomised" was mentioned, but by telephone interviewing the trial author we discovered that the allocation method, which was described as "arbitrary and not strict", was not an adequate randomisation approach. There was no random number table or other adequate randomisation and no protocol before the clinical trial
Shu 2003	"Randomised" was mentioned, but by telephone interviewing the trial author we understood that the method of allocation, which was described as "arbitrary and subjective", was not an adequate randomisation approach. There was no random number table or other adequate randomisation and no protocol before the clinical trial
Song 1999	"Randomised" was mentioned, but by telephone interviewing the trial author we understood that the method of allocation was described as "arbitrary and subjective", but without any adequate random approach
Song 2000	"Randomised" was mentioned, but by telephone interviewing the trial author we understood that the method of allocation was described as "arbitrary and subjective", but without any adequate random approach
Song 2003	"Randomised" was mentioned, but by telephone interviewing the trial author we discovered that the method of allocation, which was described as "arbitrary and subjective", was not an adequate randomisation approach
Su 2006	"Randomised" was mentioned, but by telephone interviewing the trial author we understood that the method of allocation, which was described as "arbitrary and subjective", was not an adequate randomisation approach. There was no random number table or other adequate randomisation and no protocol before the clinical trial
Sun 2005	"Randomised" was mentioned, but by telephone interviewing the trial author we discovered that the allocation method, which was described as "arbitrary and not strict", was not an adequate randomisation approach. There was no random number table or other adequate randomisation and no protocol before the clinical trial
Sun 2007	"Randomised" was mentioned, but by telephone interviewing the trial author we discovered that the method of allocation, which had been described as "according to the administration sequence", was not an adequate randomisation approach
Sun 2012	"Randomised" was mentioned, but by telephone interviewing the trial author we understood that the method of allocation was described as "arbitrary and subjective", but without any adequate random approach

Study	Reason for exclusion
Tang 1996	"Randomised" was mentioned, but by telephone interviewing the trial author we understood that the method of allocation was described as "arbitrary and subjective", but without any adequate random approach
Tang 2003	"Randomised" was mentioned, but by telephone interviewing the trial author we discovered that the method of allocation, which had been described as "according to the administration sequence", was not an adequate randomisation approach. There was no random number table or other adequate randomisation approach
Ten 2002	"Randomised" was mentioned, but by telephone interviewing the trial author we discovered that the method of allocation, which had been described as "arbitrary and non-formal", was not an adequate randomisation approach. The author knows that the method was incorrect. There was no protocol before the clinical trial
Teng 2005	"Randomised" was mentioned, but by telephone interviewing the trial author we discovered that the method of allocation, which was described as "arbitrary and subjective", was not an adequate randomisation approach
Tu 2001	"Randomised" was mentioned, but by telephone interviewing the trial author we understood that the method of allocation was described as "arbitrary and subjective", but without any adequate random approach
Wang 1999	"Randomised" was mentioned, but by telephone interviewing the trial author we discovered that the allocation method, which was described as "arbitrary and not strict", was not an adequate randomisation approach. There was no random number table or other adequate randomisation and no protocol before the clinical trial
Wang 2001	"Randomised" was mentioned, but by telephone interviewing the trial author we discovered that the method of allocation, which was described as "arbitrary and subjective", was not an adequate randomisation approach
Wang 2002a	"Randomised" was mentioned, but by telephone interviewing the trial author we discovered that the method of allocation was described as "arbitrary and subjective", but without any adequate random approach. The author knows that the method was incorrect
Wang 2002b	"Randomised" was mentioned, but by telephone interviewing the trial author we discovered that the allocation method, which was described as "arbitrary and not strict", was not an adequate randomisation approach. There was no random number table or other adequate randomisation and no protocol before the clinical trial
Wang 2003	"Randomised" was mentioned, but by telephone interviewing the trial author we understood that the method of allocation was described as "arbitrary and subjective", but without any adequate random approach
Wang 2006	"Randomised" was mentioned, but by telephone interviewing the trial author we discovered that the method of allocation, which had been described as "according to the administration sequence", was not an adequate randomisation approach. There was no random number table or other adequate randomisation
Wang 2014	"Randomised" was mentioned, but by telephone interviewing the trial author we understood that the allocation method, which was described as "arbitrary and not strict", was not an adequate randomisation approach. The author knows that the method was incorrect
Wei 2006	"Randomised" was mentioned, but by telephone interviewing the trial author we understood that the method of allocation was described as "arbitrary and subjective", but without any adequate random approach

Study	Reason for exclusion
Wu 1997	"Randomised" was mentioned, but by telephone interviewing the trial author we discovered that the allocation method, which was described as "arbitrary and not strict", was not an adequate randomisation approach. There was no random number table or other adequate randomisation and no protocol before the clinical trial
Wu 2001	"Randomised" was mentioned, but by telephone interviewing the trial author we discovered that the method of allocation was described as "arbitrary and subjective", but without any adequate random approach
Wu 2005a	"Randomised" was mentioned, but by telephone interviewing the trial author we discovered that the method of allocation was described as "arbitrary and subjective", but without any adequate random approach. The author knows that the method was incorrect. There was no protocol before the clinical trial
Wu 2005b	"Randomised" was mentioned, but by telephone interviewing the trial author we discovered that the allocation method, which was described as "arbitrary and not strict", was not an adequate randomisation approach. There was no random number table or other adequate randomisation and no protocol before the clinical trial
Wu 2010	"Randomised" was mentioned, but by telephone interviewing the trial author we discovered that the method of allocation was described as "arbitrary and subjective", but without any adequate random approach. The author knows that the method was incorrect. There was no protocol before the clinical trial
Xia 2000	"Randomised" was mentioned, but by telephone interviewing the trial author we discovered that the method of allocation, which had been described as "arbitrary and non-formal", was not an adequate randomisation approach. The author knows that the method was incorrect. There was no protocol before the clinical trial
Xin 2005	"Randomised" was mentioned, but by telephone interviewing the trial author we discovered that the method of allocation, which had been described as "according to the administration sequence", was not an adequate randomisation approach
Xu 1998	"Randomised" was mentioned, but by telephone interviewing the trial author we discovered that the method of allocation, which had been described as "arbitrary and non-formal", was not an adequate randomisation approach. The author knows that the method was incorrect. There was no protocol before the clinical trial
Xu 2000	"Randomised" was mentioned, but by telephone interviewing the trial author we discovered that the allocation method, which was described as "arbitrary and not strict", was not an adequate randomisation approach. There was no random number table or other adequate randomisation
Xu 2003a	"Randomised" was mentioned, but by telephone interviewing the trial author we discovered that the method of allocation was described as "arbitrary and subjective", but without any adequate random approach. The author knows that the method was incorrect
Xu 2003b	"Randomised" was mentioned, but by telephone interviewing the trial author we discovered that the method of allocation, which was described as "arbitrary and subjective", was not an adequate randomisation approach
Xu 2006	"Randomised" was mentioned, but by telephone interviewing the trial author we discovered that the allocation method, which was described as "voluntary", was not an adequate randomisation approach
Xue 2000	"Randomised" was mentioned, but by telephone interviewing the trial author we discovered that the method of allocation, which had been described as "arbitrary and non-formal", was not an adequate randomisation approach. The author knows that the method was incorrect

Study	Reason for exclusion
Yang 2002	"Randomised" was mentioned, but by telephone interviewing the trial author we discovered that the method of allocation was described as "arbitrary and subjective", but without any adequate random approach
Yang 2003	"Randomised" was mentioned, but by telephone interviewing the trial author we discovered that the allocation method, which was described as "arbitrary and not strict", was not an adequate randomisation approach. There was no random number table or other adequate randomisation and no protocol before the clinical trial
Yin 2004a	"Randomised" was mentioned, but by telephone interviewing the trial author we discovered that the allocation method, which was described as "arbitrary", was not an adequate randomisation approach. There was no random number table or other adequate randomisation and no protocol before the clinical trial
Yin 2004b	"Randomised" was mentioned, but by telephone interviewing the trial author we understood that the method of allocation was described as "arbitrary and subjective", but without any adequate random approach
Yin 2006	"Randomised" was mentioned, but by telephone interviewing the trial author we discovered that the method of allocation, which had been described as "according to the administration sequence", was not an adequate randomisation approach. There was no random number table or other adequate randomisation
Yue 2006	"Randomised" was mentioned, but by telephone interviewing the trial author we understood that the method of allocation was described as "arbitrary and subjective", but without any adequate random approach
Zhang 1996	"Randomised" was mentioned, but by telephone interviewing the trial author we understood that the method of allocation was described as "arbitrary and subjective", but without any adequate random approach
Zhang 1998	"Randomised" was mentioned, but by telephone interviewing the trial author we discovered that the allocation method, which was described as "arbitrary and not strict", was not an adequate randomisation approach. There was no protocol before the clinical trial
Zhang 2001a	"Randomised" was mentioned, but by telephone interviewing the trial author we understood that the method of allocation was described as "arbitrary and subjective", but without any adequate random approach
Zhang 2001b	"Randomised" was mentioned, but by telephone interviewing the trial author we understood that the method of allocation was described as "arbitrary and subjective", but without any adequate random approach
Zhang 2001c	"Randomised" was mentioned, but by telephone interviewing the trial author we understood that the method of allocation was described as "arbitrary and subjective", but without any adequate random approach
Zhang 2002a	"Randomised" was mentioned, but by telephone interviewing the trial author we discovered that the allocation method, which was described as "arbitrary and not strict", was not an adequate randomisation approach. There was no random number table or other adequate randomisation and no protocol before the clinical trial
Zhang 2002b	"Randomised" was mentioned, but by telephone interviewing the trial author we understood that the method of allocation was described as "arbitrary and subjective", but without any adequate random approach

Study	Reason for exclusion
Zhang 2002c	"Randomised" was mentioned, but by telephone interviewing the trial author we discovered that the method of allocation, which had been described as "according to the administration sequence", was not an adequate randomisation approach. There was no random number table or other adequate randomisation
Zhang 2003a	"Randomised" was mentioned, but by telephone interviewing the trial author we discovered that the method of allocation, which had been described as "arbitrary and non-formal", was not an adequate randomisation approach. There was no random number table or other adequate randomisation and no protocol before the clinical trial
Zhang 2003b	"Randomised" was mentioned, but by telephone interviewing the trial author we understood that the method of allocation was described as "arbitrary and subjective", but without any adequate random approach
Zhang 2009	"Randomised" was mentioned, but by telephone interviewing the trial author we discovered that the allocation method, which was described as "arbitrary and not strict", was not an adequate randomisation approach. There was no random number table or other adequate randomisation
Zhao 2002	"Randomised" was mentioned, but by telephone interviewing the trial author we understood that the method of allocation was described as "arbitrary and subjective", but without any adequate random approach
Zhao 2006	"Randomised" was mentioned, but by telephone interviewing the trial author we discovered that the method of allocation, which had been described as "according to the administration sequence", was not an adequate randomisation approach. There was no random number table or other adequate randomisation
Zhao 2008	"Randomised" was mentioned, but by telephone interviewing the trial author we discovered that the allocation method, which was described as "arbitrary and not strict", was not an adequate randomisation approach. There was no protocol before the clinical trial
Zhao 2009a	"Randomised" was mentioned, but by telephone interviewing the trial author we understood that the method of allocation was described as "arbitrary and subjective", but without any adequate random approach
Zhao 2009b	"Randomised" was mentioned, but by telephone interviewing the trial author we discovered that the allocation method, which was described as "arbitrary and not strict", was not an adequate randomisation approach. There was no random number table or other adequate randomisation and no protocol before the clinical trial
Zhao 2013	"Randomised" was mentioned, but by telephone interviewing the trial author we discovered that the allocation method, which was described as "voluntary", was not an adequate randomisation approach. There was no random number table or other adequate randomisation
Zhou 2000	"Randomised" was mentioned, but by telephone interviewing the trial author we discovered that the method of allocation, which had been described as "arbitrary and non-formal", was not an adequate randomisation approach. The author knows that the method was incorrect. There was no protocol before the clinical trial
Zhou 2006	"Randomised" was mentioned, but by telephone interviewing the trial author we discovered that the method of allocation, which had been described as "according to the administration sequence", was not an adequate randomisation approach. There was no random number table or other adequate randomisation
Zhu 2001	"Randomised" was mentioned, but by telephone interviewing the trial author we understood that the method of allocation, which was described as "arbitrary and subjective", was not adequate randomisation approach

Study	Reason for exclusion
Zhu 2002	"Randomised" was mentioned, but by telephone interviewing the trial author we discovered that the allocation method, which was described as "arbitrary and not strict", was not an adequate randomisation approach. There was no protocol before the clinical trial

Characteristics of studies awaiting assessment *[ordered by study ID]*

Chen 2013

Methods	"The patients were randomly allocated" mentioned, but lack of detailed information about the method of randomisation procedure
Participants	—
Interventions	—
Outcomes	—
Notes	—

Wang 2002

Methods	"Coin tossing to decide which participant would be allocated to which group" mentioned, but lack of detailed information about the randomisation procedure
Participants	—
Interventions	—
Outcomes	—
Notes	—

Yan 1998

Methods	"The patients were randomly allocated" mentioned, but lack of detailed information about the method of randomisation
Participants	—
Interventions	—
Outcomes	—
Notes	—

Zhang 1997

Methods	"The patients were randomly allocated" mentioned, but lack of detailed information about the method of randomisation
Participants	—
Interventions	—
Outcomes	—
Notes	—

APPENDICES

Appendix 1. MEDLINE (Ovid) search strategy

1 Mumps/
 2 Mumps virus/
 3 mumps.tw.
 4 epidemic parotit*.tw.
 5 infectious parotit*.tw.
 6 or/1-5
 7 Drugs, Chinese Herbal/
 8 Medicine, Chinese Traditional/
 9 Medicine, East Asian Traditional/
 10 Plants, Medicinal/
 11 (chinese adj2 (medic* or herb* or tradition*)).tw.
 12 (medic* adj2 (plant* or herb*)).tw.
 13 (shi gao or gypsum fibrosum or cai hu or bupleurum chinesenes or radix scutellariae or chinese goldthread or zhejiang or flos lonicerae or fructus forsythia or radix isatidis or puff-ball or fructus arctii or bo he or herba menthae or skunk bugbane or radix platycodi or jin ying hua or ban lan gen).tw.
 14 (silkworm adj3 batrytis).tw.
 15 or/7-14
 16 6 and 15

Appendix 2. Embase.com search strategy

#13. #5 AND #12 94 2 Jun 2011
 #12. #6 OR #7 OR #8 OR #9 OR #10 OR #11 721,220 2 Jun 2011
 #11. (silkworm NEAR/3 batrytis):ab,ti AND [embase]/lim 2 Jun 2011
 #10. 'shi gao':ab,ti OR 'gypsum fibrosum':ab,ti OR 'cai hu':ab,ti OR 'bupleurum chinesenes':ab,ti OR 'radix scutellariae':ab,ti OR 'chinese goldthread':ab,ti OR 'zhejiang figwort':ab,ti OR 'flos lonicerae':ab,ti OR 'fructus forsythia':ab,ti OR 'radix isatidis':ab,ti OR 'puff-ball':ab,ti OR 'fructus arctii':ab,ti OR 'bo he':ab,ti OR 'herba menthae':ab,ti OR 'skunk bugbane':ab,ti OR 'radix platycodi':ab,ti OR 'jin ying hua':ab,ti OR 'ban lan gen':ab,ti AND [embase]/lim 198 2 Jun 2011
 #9. (medic* NEAR/2 (plant* OR herb*)):ab,ti AND [embase]/lim 16,962 2 Jun 2011
 #8. (chinese NEAR/2 (medic* OR herb* OR tradition*)):ab,ti AND [embase]/lim 15,349 2 Jun 2011
 #7. 'herbal medicine'/de OR 'medicinal plant'/exp OR 'herbaceous agent'/de OR 'plant medicinal product'/exp AND [embase]/lim 711,552 2 Jun 2011
 #6. 'chinese medicine'/de OR 'korean medicine'/de OR 'oriental medicine'/de OR 'tibetan medicine'/de OR 'mongolian medicine'/exp AND [embase]/lim 11,885 2 Jun 2011
 #5. #1 OR #2 OR #3 OR #4 6,296 2 Jun 2011
 #4. (parotit* NEAR/1 (epidemic OR infectious)):ab,ti AND [embase]/lim 76 2 Jun 2011
 #3. mumps*:ab,ti AND [embase]/lim 4,522 2 Jun 2011
 #2. 'mumps virus'/exp AND [embase]/lim 1,455 2 Jun 2011
 #1. 'mumps'/exp AND [embase]/lim 3,551 2 Jun 2011

Appendix 3. CINAHL (Ebsco) search strategy

S17 S3 and S16 4

Chinese medicinal herbs for mumps (Review)

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S16 S4 or S5 or S6 or S7 or S8 or S9 or S10 or S11 or S12 or S13 or S14 or S15 35152
S15 TI silkworm N3 batrytis or AB silkworm N3 batrytis 0
S14 AB shi gao or gypsum fibrosum or cai hu or bupleurum chinesenes or radix scutellariae or chinese goldthread or zhejiang figwort or flos loniceræ or fructus forsythia or radix isatidis or puff-ball or fructus arctii or bo he or herba menthae or skunk bugbane or radix platycodi or jin ying hua or ban lan gen 14
S13 TI shi gao or gypsum fibrosum or cai hu or bupleurum chinesenes or radix scutellariae or chinese goldthread or zhejiang figwort or flos loniceræ or fructus forsythia or radix isatidis or puff-ball or fructus arctii or bo he or herba menthae or skunk bugbane or radix platycodi or jin ying hua or ban lan gen 3
S12 TI medic* N2 herb* or AB medic* N2 herb* 1691
S11 TI medic* N2 plant* or AB medic* N2 plant* 588
S10 TI chinese N2 tradition* or AB chinese N2 tradition* 1188
S9 TI chinese N2 tradition* or AB chinese N2 tradition* 1188
S8 TI chinese N2 herb* or AB chinese N2 herb* S 601
S7 TI chinese N2 medic* or AB chinese N2 medic 904
S6 (MH "Plants, Medicinal+") 23047
S5 (MH "Medicine, Traditional") OR (MH "Medicine, Herbal") 6030
S4 (MH "Medicine, Chinese Traditional+") 7998
S3 S1 or S2 676
S2 TI (mumps or infectious parotitis or epidemic parotitis) or AB (mumps or infectious parotitis or epidemic parotitis) 548
S1 (MH "Mumps") 301

Appendix 4. AMED (Ovid) search strategy

1 mumps.tw. (22)
2 epidemic parotitis.tw. (2)
3 infectious parotitis.tw. (0)
4 1 or 2 or 3 (24)
5 exp traditional medicine chinese/ (4862)
6 exp drugs chinese herbal/ (1403)
7 exp plants medicinal/ (16849)
8 (chinese adj2 (medic* or herb* or tradition*)).tw. (5985)
9 (medic* adj2 (plant* or herb*)).tw. (16847)
10 (shi gao or gypsum fibrosum or cai hu or bupleurum chinesenes or radix scutellariae or chinese goldthread or zhejiang figwort or flos loniceræ or fructus forsythia or radix isatidis or puff-ball or fructus arctii or bo he or herba menthae or skunk bugbane or radix platycodi or jin ying hua or ban lan gen).tw. (18)
11 (silkworm adj3 batrytis).tw. (0)
12 or/5-11 (23357)
13 4 and 12 (5)

Appendix 5. VIP search strategy

Topic/Keyword=(mumps or "mumps virus" or epidemic parotitis or infectious parotitis) AND Topic/Keyword=("chinese medicine" or "chinese traditional medicine" or "chinese herb*" or "oriental medicine" or "oriental traditional medicine" or "medicinal plant*" or herb*)
Timespan=1989 to July 2011

Appendix 6. CNKI search strategy

Title/Topic/Keyword=(mumps or "mumps virus" or epidemic parotitis or infectious parotitis) AND Title/Topic/Keyword=("chinese medicine" or "chinese traditional medicine" or "chinese herb*" or "oriental medicine" or "oriental traditional medicine" or "medicinal plant*" or herb*)
Timespan=1994 to July 2011

Appendix 7. CBM search strategy

Database: The Chinese Biomedical Database (1980 to July 2011)

1 mumps.tw.
2 epidemic parotitis.tw.
3 infectious parotitis.tw.
4 1 or 2 or 3
5 exp traditional medicine chinese/
6 exp drugs chinese herbal/
7 exp plants medicinal/
8 (chinese adj2 (medic* or herb* or tradition*)).tw.

9 (medic* adj2 (plant* or herb*)).tw.

10 8 or 5 or 6 or 7 or 9

11 4 and 10

WHAT'S NEW

Date	Event	Description
4 February 2015	New citation required but conclusions have not changed	We searched to February 2015 and added another database (Chinese Clinical Trial Registry) for completed and ongoing trials. We did not identify any new trials. We excluded five new trials (Bai 2012 ; Ma 2014 ; Sun 2012 ; Wang 2014 ; Zhao 2013). One additional study is awaiting classification as we failed to contact the trial authors (Chen 2013).
4 February 2015	New search has been performed	A new author, Dr. Yang Wen, has been added to this updated review. He participated in the telephone interviewing of the authors of the claimed RCTs, helped in the data extraction, and revised and approved the final manuscript.

HISTORY

Protocol first published: Issue 7, 2010

Review first published: Issue 9, 2012

Date	Event	Description
9 September 2010	Amended	Contact details updated.
5 August 2010	Amended	Contact details updated.

CONTRIBUTIONS OF AUTHORS

Min Shu (MS) wrote the review.

MS, Li Z (ZL), Zhang Y (YZ), and Yang W (YW) were responsible for telephoning the original authors to identify the studies.

MS, ZL, YZ, and YW were responsible for telephone interviewing the trial authors of claimed RCTs.

ZL and YW were responsible for data extraction.

Guan J Liu (GJL) was responsible for data analysis.

The manuscript was revised by all review authors.

DECLARATIONS OF INTEREST

Min Shu: the review author has no conflicting interests.

Yi Qiong Zhang: the review author has no conflicting interests.

Zhiyao Li: the review author has no conflicting interests.

Guan J Liu: the review author has no conflicting interests.

Chaomin Wan: the review author has no conflicting interests.

Yang Wen: the review author has no conflicting interests.

SOURCES OF SUPPORT

Internal sources

- Chinese Cochrane Center, China.

External sources

- Cochrane Acute Respiratory Infections (ARI) Group, Australia.

DIFFERENCES BETWEEN PROTOCOL AND REVIEW

We added another database (Chinese Clinical Trial Registry) for completed and ongoing trials.

INDEX TERMS**Medical Subject Headings (MeSH)**

Drugs, Chinese Herbal [adverse effects] [*therapeutic use]; Mumps [*drug therapy]; Phytotherapy [adverse effects] [*methods]

MeSH check words

Humans