

INPLASY

Effectiveness and mechanisms of curcumin in animal models of bleomycin-associated lung injury: A preclinical systematic review and meta-analysis

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ADMINISTRATIVE INFORMATION**Support** - NO.2019YFC1712000.**Review Stage at time of this submission** - Data analysis.**Conflicts of interest** - None declared.**INPLASY registration number:** INPLASY202370054**Amendments** - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 14 July 2023 and was last updated on 14 July 2023.**INTRODUCTION**

Review question / Objective Bleomycin (BLM) is a chemotherapeutic agent used clinically for the treatment of Hodgkin's lymphoma, squamous cell carcinoma and testicular tumours due to its potent antitumour effects; and due to the toxic effects of bleomycin on epithelial cells, it has also been used for the treatment of malignant pleural or pericardial effusions. However, however, one of the major adverse effects of BLM is pulmonary toxicity, limiting its effective use in chemotherapy, with BLM-induced lung injury occurring in 40-45% of people, of whom at least 10% develop pulmonary fibrosis, and a mortality rate of 1-3%.

Condition being studied Curcumin (CUR) is a fat-soluble natural compound widely found in the rhizomes of a variety of plants, such as turmeric, curcuma longa, tulip, calamus, and others. There is growing evidence that curcumin can resist viral and microbial infections, has anti-tumour, lipid and glucose lowering, antioxidant and free radical

scavenging effects, and is active against a wide range of diseases including cardiovascular, pulmonary, neurological, and autoimmune disorders, among many other chronic diseases. Meanwhile CUR can be used as a potential drug for the prevention and treatment of BLM-induced lung injury by exerting anti-inflammatory, antioxidant and antifibrotic effects.

METHODS

Search strategy To identify relevant animal studies without language restrictions, a systematic search was conducted from eight electronic databases, Pubmed, Embase, Web of Science, Cochrane Library, Wanfang Database, China national knowledge infrastructure(CNKI), CQVIP Database and China Biomedical Literature Database (Sinomed), for the period from the Publications from the period of database construction to 19 April 2023 were systematically searched in eight electronic databases.

Participant or population Animal studies.

Intervention The treatment group received any dose, duration, and number of curcumin monotherapy sessions. Animal studies.

Comparator This includes moulding only, or receiving the same amount of non-functional fluid or no treatment.

Study designs to be included Only animal studies evaluating the protective role of curcumin in animal models of BLM-induced lung injury (including acute lung injury and pulmonary fibrosis) were included, regardless of publication status and language.

Eligibility criteria We included controlled studies evaluating curcumin dosing in animal models of BLM-induced lung injury (including acute lung injury and pulmonary fibrosis), irrespective of animal species, age, body weight and sex.

Information sources Electronic searches were conducted from the date of construction to 19 April 2023 in eight databases without language restrictions: Pubmed, Embase, Web of Science, Cochrane Library, Wanfang Database, China national knowledge infrastructure (CNKI), CQVIP Database and China Biomedical Literature Database (Sinomed).

Main outcome(s) The primary outcome was hydroxyproline content.

Additional outcome(s) The additional outcome measures animal weight, BALF protein content, lung index, GSH-px content, the concentration of TNF- α , TGF- β and IL-10.

Quality assessment / Risk of bias analysis The Systematic Review Center for Laboratory Animal Experiments (SYRCLE) risk of bias was used.

Strategy of data synthesis R 4.3.1 and Stata 16. were used to integrate data from all included studies, and given that all outcome indicators were continuous variables, effect sizes were expressed using standardised mean differences (SMDs) and 95% confidence intervals (CIs). Heterogeneity between studies and subgroups was assessed using I², and analyses were conducted using a fixed-effects model when heterogeneity of included studies was small (I² \leq 50%) and a random-effects model when I² > 50%. Sensitivity analyses were performed to assess the stability of the overall results if the heterogeneity of the included studies was large, and subgroup analyses were performed to assess the heterogeneity and the sources of publication bias by funnel plots,

Egger's test, and Begg's test if there were sufficient studies.

Subgroup analysis To assess the influence of variables or study characteristics on the estimated effect sizes, nine subgroups were predefined: (1) animal species; (2) animal sex; (3) route of administration; (4) dose of administration; (5) time point of intervention; (6) duration of treatment; (7) BLM concentration; (8) BLM route of administration, and (9) number of BLM administrations.

Sensitivity analysis If the heterogeneity of the included studies was high, sensitivity analyses were performed to assess the stability of the overall results.

Country(ies) involved China.

Keywords Curcumin; BLM; PF; ALI; Animal Models.

Contributions of each author

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