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Ganoderma lucidum (Reishi mushroom) for cancer treatment

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Abstract

Background: Ganoderma lucidum is a natural medicine that is widely used and recommended by Asian physicians and naturopaths for its supporting effects on immune system. Laboratory research and a handful of preclinical trials have suggested that G. lucidum carries promising anticancer and immunomodulatory properties. The popularity of taking G. lucidum as an alternative medicine has been increasing in cancer patients. However, there is no systematic review that has been conducted to evaluate the actual benefits of G. lucidum in cancer treatment.

Objectives: To evaluate the clinical effects of G. lucidum on long-term survival, tumour response, host immune functions and quality of life in cancer patients, as well as adverse events associated with its use.

Search methods: We searched an extensive set of databases including the Cochrane Central Register of Controlled Trials (CENTRAL), MEDLINE, EMBASE, NIH, AMED, CBM, CNKI, CMCC and VIP Information/Chinese Scientific Journals Database was searched for randomised controlled trials (RCTs) in October 2011. Other strategies used were scanning the references of articles retrieved, handsearching of the International Journal of Medicinal Mushrooms and contact with herbal medicine experts and manufacturers of G. lucidum. For this update we updated the searches in February 2016.

Selection criteria: To be eligible for being included in this review, studies had to be RCTs comparing the efficacy of G. lucidum medications to active or placebo control in patients with cancer that had been diagnosed by pathology. All types and stages of cancer were eligible for inclusion. Trials were not restricted on the basis of language.

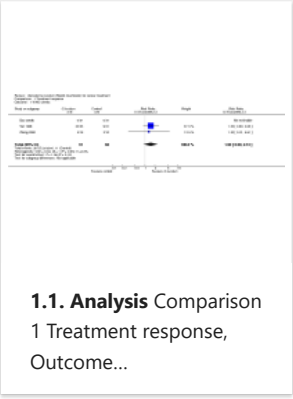
Data collection and analysis: Five RCTs met the inclusion criteria and were included in this review. Two independent review authors assessed the methodological quality of individual trials. Common primary outcomes were tumour response evaluated according to the World Health Organization (WHO) criteria, immune function parameters such as natural killer (NK)-cell activity and T-lymphocyte co-receptor subsets, and quality of life measured by the Karnofsky scale score. No trial had recorded long-term survival rates. Associated adverse events were reported in one study. A meta-analysis was performed to pool available data from the primary trials. Results were gauged using relative risks (RR) and standard mean differences (SMD) for dichotomous and continuous data respectively, with a 95% confidence interval (CI).

Main results: The methodological quality of primary studies was generally unsatisfying and the results were reported inadequately in many aspects. Additional information was not available from primary trialists. The meta-analysis results showed that patients who had been given G. lucidum

alongside with chemo/radiotherapy were more likely to respond positively compared to chemo/radiotherapy alone (RR 1.50; 95% CI 0.90 to 2.51, P = 0.02). G. lucidum treatment alone did not demonstrate the same regression rate as that seen in combined therapy. The results for host immune function indicators suggested that G. lucidum simultaneously increases the percentage of CD3, CD4 and CD8 by 3.91% (95% CI 1.92% to 5.90%, P < 0.01), 3.05% (95% CI 1.00% to 5.11%, P < 0.01) and 2.02% (95% CI 0.21% to 3.84%, P = 0.03), respectively. In addition, leukocyte, NK-cell activity and CD4/CD8 ratio were marginally elevated. Four studies showed that patients in the G. lucidum group had relatively improved quality of life in comparison to controls. One study recorded minimal side effects, including nausea and insomnia. No significant haematological or hepatological toxicity was reported.

Authors' conclusions: Our review did not find sufficient evidence to justify the use of G. lucidum as a first-line treatment for cancer. It remains uncertain whether G. lucidum helps prolong long-term cancer survival. However, G. lucidum could be administered as an alternative adjunct to conventional treatment in consideration of its potential of enhancing tumour response and stimulating host immunity. G. lucidum was generally well tolerated by most participants with only a scattered number of minor adverse events. No major toxicity was observed across the studies. Although there were few reports of harmful effect of G. lucidum, the use of its extract should be judicious, especially after thorough consideration of cost-benefit and patient preference. Future studies should put emphasis on the improvement in methodological quality and further clinical research on the effect of G. lucidum on cancer long-term survival are needed. An update to this review will be performed every two years.

Figures



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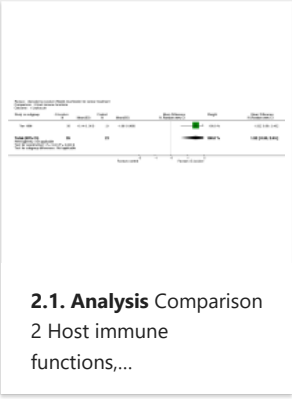

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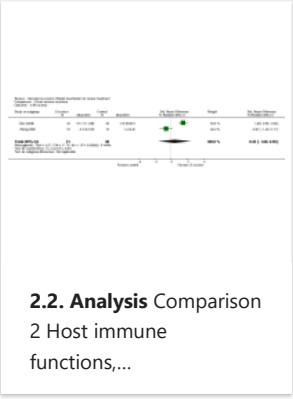

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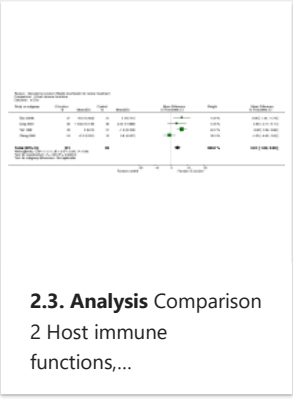

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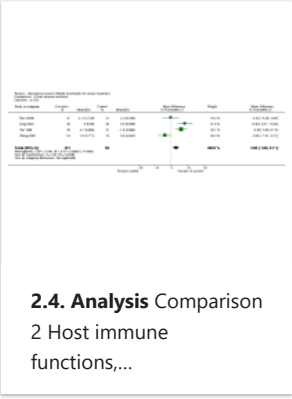

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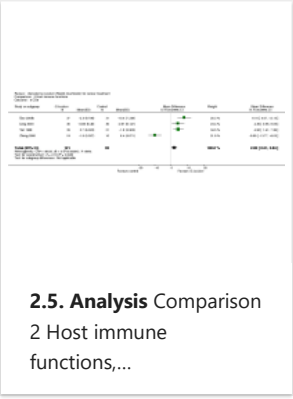

2.5. Analysis Comparison 2 Host immune functions,...

All figures (9)

Update of

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