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A Summary of a Cochrane Review: *Ganoderma lucidum* (Reishi mushroom) for the treatment of cancer

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1. Introduction

Review authors in the Cochrane Collaboration conducted a review of the effects of *Ganoderma lucidum* from Reishi mushrooms for the treatment of cancer. After searching for all relevant studies, they identified 5 studies that compared *Ganoderma lucidum* from Reishi mushrooms to placebo or to cancer treatment in people with cancer. There were 3 studies with people who had advanced lung cancer, one study with people who had surgery for rectal cancer, and another study with people who had different kinds of cancers. This summary presents the findings of these 5 studies.

1.1. *Ganoderma lucidum* and treatment of cancer

Cancer can be treated with chemotherapy or radiotherapy to kill cancer/tumour cells. *Ganoderma lucidum* is an extract from Reishi mushrooms and is used by physicians and naturopaths in Asia to treat cancer. In the laboratory, it has been shown to kill tumour cells and boost the activity of lymphocytes, such as natural killer cells (NK), T-cells and B-cells, tumour necrosis factor (TNF), and phagocytes (which ingest other cells). This review was carried out to summarize the evidence on whether *Ganoderma lucidum* can increase survival, lead to better responses to treatment, and improve the body's immune response in people who have cancer.

2. What does the research say?

There were 5 studies with 373 people who were randomly selected to receive either *Ganoderma lucidum* or a placebo or other treatment. Although most studies were from 1 to 3 months in duration, the lengths of treatment and specific dosages of *Ganoderma lucidum* were not clear.

The evidence from the studies was of low to very low quality. The quality was lower because most studies did not clearly describe how people were randomised or allocated to treatment

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with *Ganoderma lucidum* or to a placebo or other treatment, and there were few or very few people in the studies. In some cases, the results from the individual studies were also inconsistent. Based on the evidence to date, using *Ganoderma lucidum* for cancer treatment may increase the chance of better response to treatment, but this is uncertain. It may improve the body's immune response, in particular, on T-cells, but the effect on natural killer cells (NK activity) is uncertain. It may improve quality of life and it may have little or no effect on adverse events. These studies were all short-term and did not measure survival after cancer, which is an important outcome that should be measured in future research (see Table 1). The authors of the review also noted that it may be possible that *Ganoderma lucidum* has better effects when used in combination with other cancer treatments instead of when it is used alone, but that this also requires more research to determine.

3. Where does this information come from?

This summary is based on a Cochrane systematic review: Jin X, Ruiz Beguerie J, Sze DMY, Chan GCF. *Ganoderma lucidum* (Reishi mushroom) for cancer treatment. Cochrane Database of Systematic Reviews 2016, Issue 4. Art. No.: CD007731. DOI: 10.1002/14651858.CD007731.pub3.

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Summary of Findings Table

Effects of Ganoderma lucidum for the treatment of cancer

What was measured	Effect when NOT receiving Ganoderma lucidum	Effect when receiving Ganoderma lucidum	Quality of the evidence	What happens when receiving Ganoderma lucidum
Survival	Not measured in the studies			
Good response to treatment (full or partial response) (2 studies, 85 people)	20 out of 100 people	10 more people (from 2 fewer to 30 more)	⊕⊕⊕⊕ very low^a	There may be more people with full or partial response to treatment, but this is uncertain.
Number of people with better quality of life (3 studies, 284 people)	30 out of 100 people	45 more people (from 26 to 70 more)	⊕⊕⊕⊕ low^b	There may be more people with better quality of life.
Activity of natural killer cells (NK) (2 studies, 89 people)	One study reported that NK activity was greater with Ganoderma lucidum. The other study found the opposite effect.		⊕⊕⊕⊕ very low^c	The effect on natural killer cell activity is uncertain.
Higher levels mean better activity.				
Immune response (T-cells) (4 studies, 213 people) Higher levels mean better activity.	The CD3, CD4, and CD8 cell counts increased by about 2–4% more with Ganoderma lucidum.		⊕⊕⊕⊕ low^b	The immune response may be increased.
Adverse events (5 studies, 373 people)	No studies reported hepatitis, abnormal liver function tests, or any other abnormal laboratory tests. In one study, 3 people taking Ganoderma lucidum reported nausea or insomnia.		⊕⊕⊕⊕ low^b	There may be little or no effect on adverse events.

a. Details about the quality of the evidence:

^aEvidence was very low quality because it is unclear if some of the studies appropriately randomised people to receive Ganoderma lucidum or not, and there were very few people in the studies providing data.

^bEvidence was low quality because it is unclear if some of the studies appropriately randomised people to receive Ganoderma lucidum or not, and there were few people in the studies providing data.

^cEvidence was very low quality because it is unclear if some of the studies appropriately randomised people to receive Ganoderma lucidum or not, there were few people in the studies providing data, and the results were inconsistent.