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[Intervention Review]

Probiotics for preventing acute upper respiratory tract infections

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ABSTRACT

Background

Probiotics may improve a person's health by regulating their immune function. Some trials have shown that probiotic strains can prevent respiratory infections. Even though the previous version of our review showed benefits of probiotics for acute upper respiratory tract infections (URTIs), several new studies have been published.

Objectives

To assess the effectiveness and safety of probiotics (any specified strain or dose), compared with placebo, in the prevention of acute URTIs in people of all ages, at risk of acute URTIs.

Search methods

We searched CENTRAL (2014, Issue 6), MEDLINE (1950 to July week 3, 2014), EMBASE (1974 to July 2014), Web of Science (1900 to July 2014), the Chinese Biomedical Literature Database, which includes the China Biological Medicine Database (from 1978 to July 2014), the Chinese Medicine Popular Science Literature Database (from 2000 to July 2014) and the Masters Degree Dissertation of Beijing Union Medical College Database (from 1981 to July 2014). We also searched the World Health Organization (WHO) International Clinical Trials Registry Platform (ICTRP) and ClinicalTrials.gov for completed and ongoing trials on 31 July 2014.

Selection criteria

Randomised controlled trials (RCTs) comparing probiotics with placebo to prevent acute URTIs.

Data collection and analysis

Two review authors independently assessed the eligibility and quality of trials, and extracted data using the standard methodological procedures expected by The Cochrane Collaboration.

Main results

We included 13 RCTs, although we could only extract data to meta-analyse 12 trials, which involved 3720 participants including children, adults (aged around 40 years) and older people. We found that probiotics were better than placebo when measuring the number of participants experiencing episodes of acute URTI (at least one episode: odds ratio (OR) 0.53; 95% confidence interval (CI) 0.37 to 0.76, P value < 0.001, low quality evidence; at least three episodes: OR 0.53; 95% CI 0.36 to 0.80, P value = 0.002, low quality evidence); the mean duration of an episode of acute URTI (mean difference (MD) -1.89; 95% CI -2.03 to -1.75, P value < 0.001, low quality evidence); reduced antibiotic prescription rates for acute URTIs (OR 0.65; 95% CI 0.45 to 0.94, moderate quality evidence) and cold-related school absence (OR 0.10; 95% CI 0.02 to 0.47, very low quality evidence). Probiotics and placebo were similar when measuring the rate ratio of episodes of acute URTI (rate ratio 0.83; 95% CI 0.66 to 1.05, P value = 0.12, very low quality evidence) and adverse events (OR 0.88; 95% CI 0.65 to 1.19, P value

= 0.40, low quality evidence). Side effects of probiotics were minor and gastrointestinal symptoms were the most common. We found that some subgroups had a high level of heterogeneity when we conducted pooled analyses and the evidence level was low or very low quality.

Authors' conclusions

Probiotics were better than placebo in reducing the number of participants experiencing episodes of acute URTI, the mean duration of an episode of acute URTI, antibiotic use and cold-related school absence. This indicates that probiotics may be more beneficial than placebo for preventing acute URTIs. However, the quality of the evidence was low or very low.

PLAIN LANGUAGE SUMMARY

Probiotics (live micro-organisms) to prevent upper respiratory tract infections (URTIs) (for example, the common cold)

Review question

With the increasing consumption of probiotics (live micro-organisms), we carried out a review on the effects of probiotics in helping people (without immunodeficiencies) to avoid acute upper respiratory tract infections (URTIs), for example, the common cold, compared to placebo.

Background

URTIs include the common cold and inflammation of the trachea and larynx, with symptoms including fever, cough, pain and headaches. Most acute URTIs are caused by viral infections and usually resolve after three to seven days. To reduce the incidence of these infections, specific vaccines are often recommended, especially for children and old people.

Some probiotics (live micro-organisms) can confer a health benefit to the patient when administered in adequate amounts. Lactic acid bacteria and bifidobacteria are the most common types of probiotics. They are commonly consumed in fermented foods, such as yogurt and soy yogurt, or as dietary supplements. However, their effects in preventing URTIs are still poorly understood.

Study characteristics and search date

After searching for all relevant trials in scientific databases, we identified 13 randomised controlled trials (RCTs) published up to July 2014. We could extract and pool data from 12 RCTs, which involved 3720 participants (both genders), including children, adults (aged around 40 years) and older people from Finland, Spain, Sweden, the United States, Croatia, Chile, Thailand and Japan.

Key results

Probiotics were found to be better than placebo in reducing the number of participants experiencing episodes of acute URTI by about 47% and the duration of an episode of acute URTI by about 1.89 days. Probiotics may slightly reduce antibiotic use and cold-related school absence. Side effects of probiotics were minor and gastrointestinal symptoms were the most common.

Quality of the evidence

The quality of the evidence is low or very low mainly due to poorly conducted trials, for example with unclear randomisation method and blinding. Some trials were supported by manufacturers of the tested probiotics and some trials had a very small sample size.

Conclusion

Overall, we found probiotics to be better than placebo in preventing acute URTIs. However, more trials are needed to confirm this conclusion.