Cochrane Library

Cochrane Database of Systematic Reviews

Postoperative radiotherapy for non-small cell lung cancer (Review)

Burdett S, Rydzewska L, Tierney J, Fisher D, Parmar MKB, Arriagada R, Pignon JP, Le Pechoux C, on behalf of the PORT Meta-analysis Trialists Group

Burdett S, Rydzewska L, Tierney J, Fisher D, Parmar MKB, Arriagada R, Pignon JP, Le Pechoux C, on behalf of the PORT Meta-analysis Trialists Group.
Postoperative radiotherapy for non-small cell lung cancer.
Cochrane Database of Systematic Reviews 2016, Issue 10. Art. No.: CD002142.
DOI: 10.1002/14651858.CD002142.pub4.

www.cochranelibrary.com

WILEY

[Intervention Review]

Postoperative radiotherapy for non-small cell lung cancer

Sarah Burdett[1], Larysa Rydzewska[1], Jayne Tierney[1], David Fisher[2], Mahesh KB Parmar[2], Rodrigo Arriagada[3], Jean Pierre Pignon[4], Cecile Le Pechoux[5], on behalf of the PORT Meta-analysis Trialists Group[1]

[1]Meta-analysis Group, MRC Clinical Trials Unit at UCL, London, UK. [2]MRC Clinical Trials Unit at UCL, London, UK. [3]Karolinska Institutet, Stockholm, Sweden. [4]Plateforme LNCC de Méta-analyse en Oncologie et Service de Biostatistique et d'Epidémiologie, Gustave Roussy Cancer Campus, Villejuif, France. [5]Département de Radiothérapie, Gustave Roussy Cancer Campus, Villejuif, France

Contact address: Sarah Burdett, Meta-analysis Group, MRC Clinical Trials Unit at UCL, Aviation House, 125 Kingsway, London, WC2B 6NH, UK. sarah.burdett@ucl.ac.uk.

Editorial group: Cochrane Lung Cancer Group.
Publication status and date: New search for studies and content updated (no change to conclusions), published in Issue 10, 2016.

Citation: Burdett S, Rydzewska L, Tierney J, Fisher D, Parmar MKB, Arriagada R, Pignon JP, Le Pechoux C, on behalf of the PORT Meta-analysis Trialists Group. Postoperative radiotherapy for non-small cell lung cancer. *Cochrane Database of Systematic Reviews* 2016, Issue 10. Art. No.: CD002142. DOI: 10.1002/14651858.CD002142.pub4.

ABSTRACT

Background

The role of postoperative radiotherapy (PORT) in the treatment of patients with completely resected non-small cell lung cancer (NSCLC) was not clear. A systematic review and individual participant data meta-analysis was undertaken to evaluate available evidence from randomised controlled trials (RCTs). These results were first published in *Lung Cancer* in 2013.

Objectives

To evaluate the effects of PORT on survival and recurrence in patients with completely resected NSCLC. To investigate whether predefined patient subgroups benefit more or less from PORT.

Search methods

We supplemented MEDLINE and CANCERLIT searches (1965 to 8 July 2016) with information from trial registers, handsearching of relevant meeting proceedings and discussion with trialists and organisations.

Selection criteria

We included trials of surgery versus surgery plus radiotherapy, provided they randomised participants with NSCLC using a method that precluded prior knowledge of treatment assignment.

Data collection and analysis

We carried out a quantitative meta-analysis using updated information from individual participants from all randomised trials. We sought data on all participants from those responsible for the trial. We obtained updated individual participant data (IPD) on survival and date of last follow-up, as well as details on treatment allocation, date of randomisation, age, sex, histological cell type, stage, nodal status and performance status. To avoid potential bias, we requested information on all randomised participants, including those excluded from investigators' original analyses. We conducted all analyses on intention-to-treat on the endpoint of survival.

Main results

We identified 14 trials evaluating surgery versus surgery plus radiotherapy. Individual participant data were available for 11 of these trials, and our analyses are based on 2343 participants (1511 deaths). Results show a significant adverse effect of PORT on survival, with a hazard ratio of 1.18, or an 18% relative increase in risk of death. This is equivalent to an absolute detriment of 5% at two years (95% confidence

interval (CI) 2% to 9%), reducing overall survival from 58% to 53%. Subgroup analyses showed no differences in effects of PORT by any participant subgroup covariate.

We did not undertake analysis of the effects of PORT on quality of life and adverse events. Investigators did not routinely collect quality of life information during these trials, and it was unlikely that any benefit of PORT would offset the observed survival disadvantage. We considered risk of bias in the included trials to be low.

Authors' conclusions

Results from 11 trials and 2343 participants show that PORT is detrimental to those with completely resected non-small cell lung cancer and should not be used in the routine treatment of such patients. Results of ongoing RCTs will clarify the effects of modern radiotherapy in patients with N2 tumours.

PLAIN LANGUAGE SUMMARY

Postoperative radiotherapy for non-small cell lung cancer

Review question

Do patients with non-small cell lung cancer live longer if they are given radiotherapy after surgery?

Background

Non-small cell lung cancer is the most common type of lung cancer. If the tumour is early stage, is not too big and has not spread to other parts of the body, doctors usually operate to remove it. Radiotherapy (treatment with x-rays) is sometimes given after the operation, aiming to kill any remaining cancer cells.

In 1998, we did a systematic review and meta-analysis of individual participant data looking at trials of this treatment - postoperative radiotherapy (PORT). This review brought together information from all patients who took part in similar trials. These trials compared what happened to people with non-small cell lung cancer who were given radiotherapy after surgery and those who had surgery without radiotherapy. Results were first published in *The Lancet* in 1998.

Since this review was completed, many trials have been done. To ensure that available evidence is as up-to-date as possible, we carried out a new systematic review and meta-analysis of individual participant data that included all trials, old and new. As for the 1998 review, this review aimed to find out if giving radiotherapy after surgery (1) helps patients live longer, (2) stops cancer from coming back (recurrence) and (3) stops cancer from spreading to other parts of the body (metastases).

These updated results were first published in *Lung Cancer* in 2013.

Study characteristics

We searched for relevant trials up to 8 July 2016. These studies brought together available trial data from all over the world, with 11 trials and 2343 patients. Trials were carried out between 1966 and 1998.

Key results

Results showed that fewer people given PORT treatment lived for two years after the operation (53 out of every 100 patients) than those not given PORT after the operation (58 out of every 100 patients). Researchers reported no difference in effects of PORT by types of patients included in trials.

Researchers did not routinely collect quality of life information during the trials, and it was unlikely that any benefit of PORT would offset the observed survival disadvantage.

Radiotherapy given after successful removal of tumour at operation is not beneficial for patients with non-small cell lung cancer and should not be used as routine treatment; however, further research into new types of radiotherapy for patients at higher risk of recurrence is ongoing.

Quality of evidence

These systematic reviews and meta-analyses use individual participant data, which are considered the gold standard for this type of review. We included all eligible trials, if possible, no matter what language they were published in, or whether or not they were published. This meta-analysis included 88% of all participants in eligible trials.

Studies were well designed and conducted and addressed the review question, with consistent effects noted across trials. The impact of any data not included in our analyses is small.