INPLASY PROTOCOL

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Conflicts of interest:
None declared.

I-125 seeds insertion with trans-arterial chemical infusion for advanced lung cancer: a meta-analysis

Hong, J[1]; Yang, L[2].

Review question / Objective: **This meta-analysis is conducted to investigate the clinical efficacy of combined trans-arterial chemical infusion (TAI) and I-125 seeds insertion (ISI) for advanced lung cancer (LC).**
Condition being studied: **Lung cancer (LC) is the leading cause of the cancer-related death worldwide. Approximate 80% of LCs are inoperable due to the advanced tumor stage. Systematic chemotherapy and/or radiation therapy have been commonly used for the inoperable LCs. However, many patients cannot tolerate the intensive and systematic treatment due to their elder age and/or poor body condition. The traditional external radiotherapy is also typically correlated with radiation-driven complications, and the radiological dosing is restricted by the distance the tumor is to healthy tissue and vital organs. Along with the development of interventional therapy, the local treatment options, which include computed tomography (CT)-guided I-125 seeds insertion (ISI) and trans-arterial chemical infusion (TAI) have been widely used for the patients with inoperable LC. The advantages of the interventional therapies include the mini-invasive nature and lower treatment-related toxicity. However, the clinical efficacy of TAI and ISI alone is usually limited. Therefore, many researchers combined the TAI and ISI together to treat the advanced LC. The results from a single study may be influenced by many factors, a meta-analysis should be carried out to decrease the bias and increase the statistical power of the small sample studies.**

INPLASY registration number: This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 16 November 2021 and was last updated on 16 November 2021 (registration number INPLASY2021110058).

INTRODUCTION

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Condition being studied: Lung cancer (LC) is the leading cause of the cancer-related death worldwide. Approximate 80% of LCs are inoperable due to the advanced tumor stage. Systematic chemotherapy and/or radiation therapy have been commonly used for the inoperable LCs. However, many patients cannot tolerate the intensive and systematic treatment due to their elder age and/or poor body condition. The traditional external radiotherapy is also typically correlated with radiation-driven complications, and the radiological dosing is restricted by the distance the tumor is to healthy tissue and vital organs. Along with the development of interventional therapy, the local treatment options, which include computed tomography (CT)-guided I-125 seeds insertion (ISI) and trans-arterial chemical infusion (TAI) have been widely used for the patients with inoperable LC. The advantages of the interventional therapies include the mini-invasive nature and lower treatment-related toxicity. However, the clinical efficacy of TAI and ISI alone is usually limited. Therefore, many researchers combined the TAI and ISI together to treat the advanced LC. The results from a single study may be influenced by many factors, a meta-analysis should be carried out to decrease the bias and increase the statistical power of the small sample studies.

METHODS

Search strategy: (((((Iodine-125) OR (I125)) OR (125I)) OR (brachytherapy)) AND ((lung cancer) OR (NSCLC))) AND (chemotherapy).

Participant or population: Advanced lung cancer.

Intervention: Combined TAI and ISI.

Comparator: TAI alone.

Study designs to be included: The following articles were included in the meta-analysis: (a) Type of investigation: comparative studies;(b) Disease: advanced LC;(c) Types of interventions: TAI with ISI versus TAI alone;(d) Languages: not limited.The following articles were eliminated from the meta-analysis: (a) single-arm studies, case reports, reviews, and experimental studies; (b) studies without English title or abstract.

Eligibility criteria: The following articles were included in the meta-analysis:(a) Type of investigation: comparative studies;(b) Disease: advanced LC (tumor stage ≥ III);(c) Types of interventions: TAI with ISI versus TAI alone.

Information sources: Relevant studies were researched in PubMed, Embase, Cochrane Library, CINK, Wanfang, and VIP (until October 2021) using the following search terminologies: (((((Iodine-125) OR (I125)) OR (125I)) OR (brachytherapy)) AND ((lung cancer) OR (NSCLC))) AND (chemotherapy).

Main outcome(s): Treatment success.

Quality assessment / Risk of bias analysis: The randomized controlled trials (RCTs) are assessed by the Cochrane risk of bias tool. The bias of RCTs is assessed from the bias of performance, attrition, detection, selection, reporting, and other sources. Non-RCTs are analyzed with the 9-point Newcastle-Ottawa scale (NOS), with studies exhibiting low, intermediate, or high levels of risk receiving scores of ≥ 7, 4-6, and < 4, respectively. The items of NOS include selection (4 points), comparability (2 points), and exposure (3 points).

Strategy of data synthesis: RevMan v5.3 and Stata 12.0 are used for all data analyses. Dichotomous variables are pooled based on the odds ratios (ORs) with 95% confidence intervals (CIs), whereas continuous variables are pooled based on the mean difference (MD) with 95% CIs. Heterogeneity is assessed by $\chi 2$ and I2 tests, with I2 > 50% being indicative of significant heterogeneity. Random-effects models are used in the presence of significant heterogeneity, whereas fixed-effects models are used when significant homogeneity is detected. The sources of heterogeneity are evaluated by sensitivity and subgroup analyses. Funnel plots and Egger test are used to assess the risk of publication bias.

Subgroup analysis: Yes.

Sensitivity analysis: Yes.

Country(ies) involved: China.

Keywords: lung cancer; I-125 seed; trans-arterial chemical infusion; treatment response.

Contributions of each author:
Author 1 - Jiao Hong.
Author 2 - Lu-Lu Yang.