INPLASY PROTOCOL

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None declared.

Efficacy and safety of different antibacterial regimens in the treatment of severe bacterial pneumonia: A network meta-analysis

Hou, SX[1]; Jiang, HM[2]; Liu, HR[3].

Review question / Objective: **The aim of this study is to evaluate the clinical efficacy of different antibacterial regimens in the treatment of patients with severe pneumonia.The included studies were randomized controlled trials.**

Condition being studied: **Severe pneumonia is a progressive pulmonary inflammation that can rapidly evolve from local infection to systemic infection, severe sepsis, septic shock, and multiple organ dysfunction syndrome. It is a common clinical respiratory acute critical illness mainly including severe community-acquired pneumonia and severe hospital-acquired pneumonia. Among all hospitalized patients with pneumonia, 10%-20% are severe pneumonia patients who require ventilator support and are admitted to the ICU for treatment . Although the management of pneumonia and antibiotic guidelines have made great progress, the mortality rate of severe community-acquired pneumonia is still as high as 25-50%, and the mortality rate of patients with delayed admission to the ICU will further increase, bringing a huge economic and social burden.**

INPLASY registration number: This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 19 September 2022 and was last updated on 19 September 2022 (registration number INPLASY202290093).

INTRODUCTION

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METHODS

Participant or population: The study population was diagnosed with severe pneumonia using relevant guidelines, with no restrictions on nationality, ethnicity, etc., and the age of patients was generally required to be ≥ 18 years old.

Intervention: Different antibacterial regimens,such as β-lactams + macrolides, β-lactams + respiratory fluoroquinolones, carbapenems, β-lactams monotherapy, respiratory fluoroquinolones monotherapy, dual β-lactams combination therapy, and tetracyclines.

Comparator: Other antimicrobial regimens that differ from interventions.

Study designs to be included: RCT.

Eligibility criteria: The criteria of severe pneumonia include:Major criteria: ① invasive mechanical ventilation is required; ② septic shock requires vasoconstrictor therapy. Secondary criteria: ①Respiratory rate ≥30 times/min; ②Oxygenation index (Pa()2/Fi02)≤250; ③Multilobar infiltration; ④ Hypothermia (T < 36°C); ⑤ Leukopenia (wBC<4.0×109/L); ⑥ Thrombocytopenia (platelet <10.0×10/L); ⑦Hypotension, which requires strong fluid resuscitation; ⑧ Consciousness disorder / disorientation; ⑨ Azotemia (BuN≥20mg/dL). Severe pneumonia can be diagnosed if one major criterion or more than three minor criteria are met.

Information sources: CNKI、PubMed、Wanfang Database.

Main outcome(s): The primary outcomes were total effectiveness after the end of treatment.

Quality assessment / Risk of bias analysis: the Cochrane Risk Assessment Tool.

Strategy of data synthesis: The evidence network diagram was drawn using Stata 16.0 statistical software to show the direct comparison and indirect comparison between different interventions.The counting data used the odds ratio (OR), and the measurement data used the weighted mean difference (WMD), all of which were expressed as 95% confidence intervals (CI). The inconsistency test was used to analyze the heterogeneity between studies, P>0.05 considered no heterogeneity, and a consistent model was fitted; otherwise, an inconsistent model was fitted. The inconsistency test of direct comparison and indirect comparison was carried out by the node splitting method, and P<0.05 indicated inconsistency. The rank probability ranking chart was used to rank different drug treatment regimens.

Subgroup analysis: Subgroup analysis by type of antimicrobial regimen.

Sensitivity analysis: Sensitivity analysis was performed with stata software, and the sensitivity of the article was reflected by the change in effect size after deleting one of the articles.Sensitivity analysis of findings was performed using funnel diagrams or clinical similarities and methodological consistency of the included studies.

Country(ies) involved: China.

Keywords: severe pneumonia, severe community-acquired pneumonia, randomized controlled trials, antibiotics, antibacterial agents.

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