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Editorial

Pneumonia Patients Associated with Ventilator with Short-Course Antimicrobial Treatment

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Pneumonia, the second most prevalent nosocomial infection among patients in critical care, affects almost 27% of all critically ill patients [1]. Linkage to mechanical ventilation is found around 86% of nosocomial pneumonia patients and are referred to as ventilator-associated pneumonia (VAP) [1]. Due to instrumentation of the airway during mechanical ventilation, which lasts for >48 h, the oropharynx and trachea structures may be affected. Secretions and flora from upper respiratory tract can infiltrate the lower respiratory system causing VAP by affecting the lung parenchyma [2]. Vital and appropriate coverage for the organisms among critically-ill patients due common antimicrobial resistance [3]. Around 6% of VAP-associated mortality with 0% to 50% of excess risk estimates was found [4-6]. Ventilator-associated pneumonia (VAP) is associated with increased mortality, prolonged hospitalization, excessive antimicrobial use and, consequently, increased antimicrobial resistance (Figure 1) [7].

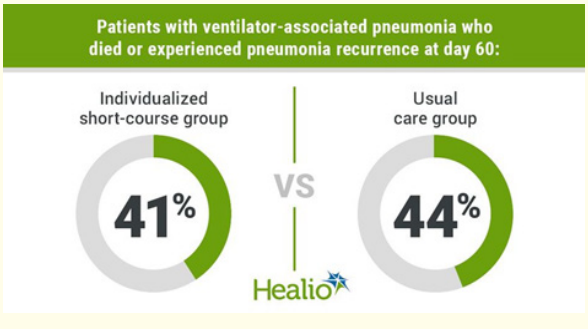

Figure 1: Demonstrating percentage of patients with VAP died or experienced pneumonia recurrence at day 60 [7].

There is limitation and restriction of the VAP-antimicrobial-optimal-duration therapy with a few clinical-trial findings in current literature. By current guidelines, recommend a short-duration-VAP treatment of 7–8 days [8,9] which was largely based on the evidence provided within the previous two meta-analyses [10,11]. Meta-analysis conducted by Pugh et al. and reported in 2015 that short duration was non-inferior to the long duration for mortality and recurrence [12,13]. By considering the subgroup-VAP patients with non-fermenting Gram-negative bacilli (NF-GNB) cause, a higher rate of recurrence of pneumonia in the short-duration therapy arm was found. Augmenting this concern, the results from a recently published randomized controlled trial (RCT), named " iDIAPASON trial", conducted by Bougle et al. failed to demonstrate the non-inferiority of short-duration antimicrobial therapy in patients with VAP due to Pseudomonas aeruginosa because of a higher risk of recurrence of pneumonia with the shorter regimen. Nevertheless, this trial did not have a sample size large enough to make a definitive conclusion. A recent study was conducted between May 25, 2018, and Dec 16, 2022, 461 enrolled patients were randomly assigned to the short-course treatment group (n = 232) or the usual care group (n = 229) [7]. After excluding one withdrawal (231 in the short-course group, and 229 in the usual care group), median age was 64 years (IQR 51-74) and 181 (39%) participants were female. 460 were included in the intention-to-treat analysis and in the per-protocol population; 435 participants received the allocated treatment and fulfilled eligibility criteria. Median antimicrobial treatment duration for the index episodes of VAP-short-course group was 6 days (IQR: 5-7) and in the VAP-

usual-care group revealed 14 days (10-21). In comparison with 100 (44%) of 229 in the usual care group (risk difference -3% [one-sided 95% CI: 0% to 5%]), compared with 95 (41%) of 231 participants in the short-course group met the primary outcome. The study results were similar in the per-protocol population. In analyses, although superiority compared with usual care was not established, non-inferiority of short-course antibiotic treatment was met [7].

In conclusion, in light of the previous uncertainty and the availability of newer data, systematically, there is a need to re-assess the VAP-antimicrobial-optimal duration, especially due to NF-GNB. VAP is associated with excessive antimicrobial use, increased antimicrobial resistance, prolonged hospitalization, and increased mortality. Personally, short-course-VAP- antimicrobial treatment could assist decreasing the side-effect-of-antimicrobial burden and the risk of antimicrobial resistance in high-resource and resource-limited settings (Figure 2) [13,14].

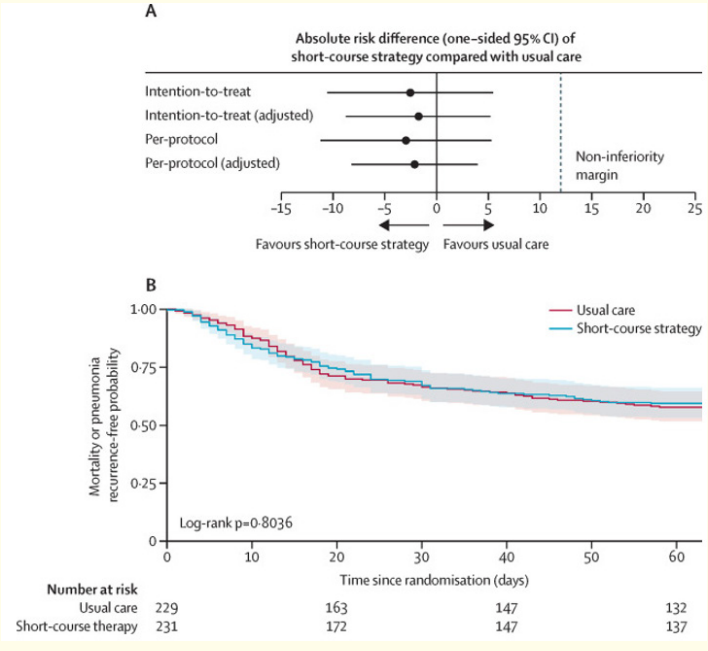

Figure 2: Demonstrating absolute risk difference (one-side 95% CI) of short-course antimicrobial treatment strategy compared with usual course antimicrobial treatment strategy [13,14].

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