

Methylene blue for septic shock: a systematic review and meta-analysis of hemodynamic effects

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Argomento: Altro

Background: Methylene blue (MB) has been used as a potential adjunct in the treatment of vasodilatory shock, as it increases blood pressure by interfering with guanylate cyclase activity, preventing cyclic guanosine monophosphate production and the ensuing vasodilation. However, its effect on different hemodynamic parameters is unclear. The aim of this meta-analysis is to analyze the literature available on the effect of MB on hemodynamic parameters including mean arterial blood pressure (MAP), and lactate values in patients with septic shock.

Methods: We performed a systematic review with meta-analysis based on a comprehensive search of four databases (PubMed/MEDLINE, ISI/Web of Science, Scopus and Google Scholar). Prospero registration: CRD42018089020.

Results: A total of 21 papers evaluated the effects of MB on MAP (fig. 1A). Effect size resulted 0.90 [95%CI 0.71-1.10], p-value <0.0001 (fixed effect model). Considering lactate levels, 10 studies were included (fig. 1B). Effect size resulted -0.246 [95%CI -0.490- -0.003], p-value <0.0001 (fixed effect model). Using meta-regression analysis, mean age of the sample, years of publication, the percentage of men, time and dose of MB did not have a statistically significant impact on effect size for both parameters. No publication bias was found according to visual assessment of funnel plot and Egger linear regression.

Conclusions: According to our results, MB has a significant effect on hemodynamic parameters, determining an increase of MAP and a decrease in lactate levels in patients with septic shock. There is a need for well-designed prospective studies to more precisely assess the effect of MB on other hemodynamic parameters and outcome in this group of patients.

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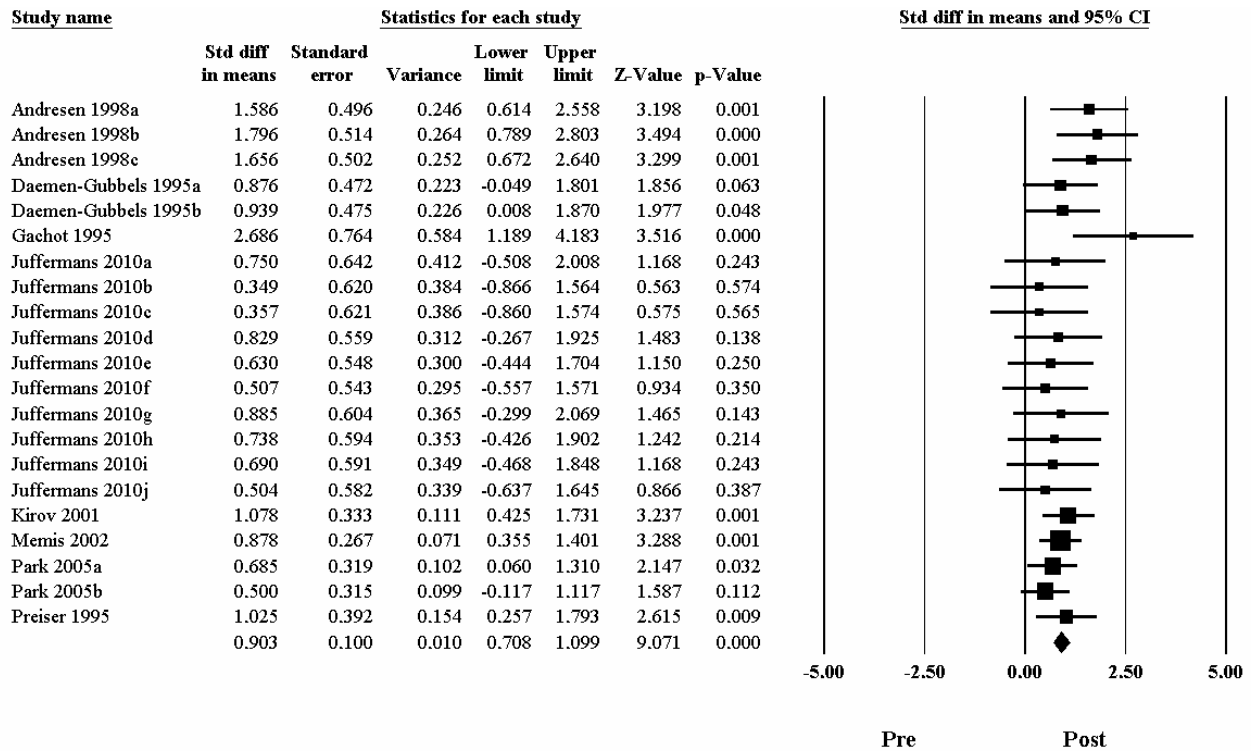


Fig. 1 A Effect size of methylene blue on mean arterial pressure.

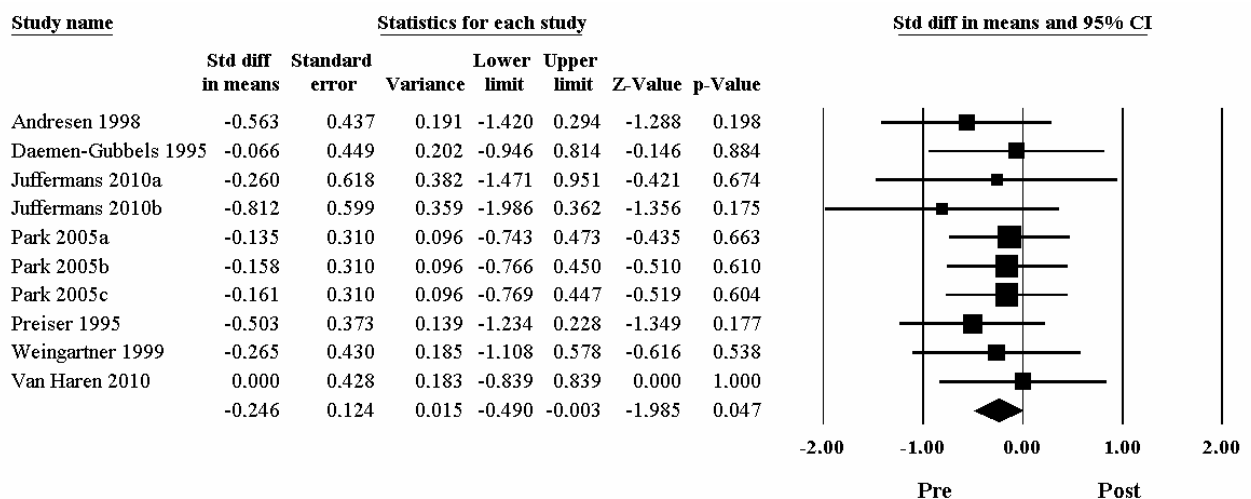


Fig. 1 B Effect size of methylene blue on blood lactate levels.