Hemodynamic effects of a low versus a high dose of propofol during induction of anesthesia. A randomized trial

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Background: Hypotension is common after anesthesia induction with propofol and is associated with increased morbidity. It is important to examine the effects of the proposed interventions to limit preventable hypotension, as suggested by the reduction in the dose of propofol. Our objective was to investigate whether a high dose of propofol is inferior to a low dose with respect to changes in systolic arterial blood pressure (SAP).

Methods: This randomized, double-blind, dose-controlled, non-inferiority study included 68 healthy women scheduled for gynecological surgery at the Day Surgery Unit, Haugesund Hospital, Norway. The patients were randomly allocated 1:1 to a low or high dose (1.4 mg/kg total body weight (TBW) versus 2.7 mg/kg TBW of propofol corresponding to maximal effect site concentrations (Ce) of 2.0 μg/mL versus 4.0 μg/mL. The dose of remifentanil was 1.9–2.0 μg/kg TBW, with maximal Ce of 5.0 ng/mL. The patients were observed for 450 s from the start of the infusions. The first 150 s was the sedation period, after which a bolus of propofol and remifentanil was administered. Baseline was defined as 55–5 s before the bolus doses. LiDCOplus was used for invasive beat-to-beat hemodynamic monitoring of changes in SAP, heart rate (HR), cardiac output (CO), stroke volume (SV), and systemic vascular resistance (SVR). A difference of 10 mmHg in the change in SAP was considered to be clinically important.

Results: The SAP change difference for low versus high dose was −2.9 mmHg (95% CI −9.0–3.1). The relative changes for low versus high dose were SAP −31% versus −36%, ($p < .01$); HR −24% versus −20%, ($p = .09$); SVR −20% versus −31%, ($p < .001$); SV −16% versus −20%, ($p = .04$); and CO −35% versus −32%, ($p = .33$).

Conclusion: A high dose of propofol was not inferior to a low dose, and a reduction in the dose of propofol did not result in clinically important attenuation of major hemodynamic changes during induction in healthy women.

Trial Registration: ClinicalTrials.gov identifier NCT 03861364, January 3, 2019.