The effects of pre-anesthetic single-dose dexmedetomidine on attenuation of stress response to endotracheal intubation

Objectives

This randomized and double-blinded study aimed to investigate the effects of pre-anesthetic single-dose dexmedetomidine on attenuation of stress response to endotracheal intubation in patients with general anesthesia.

Methods

Sixty ASA I～II patients aged 20-51 years scheduled for gynecologic laparoscopy procedure with general anesthesia were randomly divided into two groups. The final enrollment was 53 patients. 28 patients involved into group D (study group) received intravenous infusion of dexmedetomidine 0.6μg/kg diluted with normal saline over 15 min before induction. 25 patients involved into group C (control group) received the same volume of normal saline infusion. Anesthesia was induced with propofol (Target-controlled infusion, plasma concentration 3μg/ml),fentanyl (3μg/kg) and rocuronium (0.6mg/kg). Endotracheal intubation was performed when plasma concentration of propofol reached to 3μg/ml. Hemodynamic parameters including heart rate (HR) and mean arterial pressure (MAP) at baseline, before induction (right after finishing infusion of dexmedetomidine or normal saline), and right after tracheal intubation were documented. Plasma concentrations of norepinephrine and epinephrine at baseline and after intubation were measured by high performance liquid chromatography.

Results:

In group D, hemodynamic parameters kept stable during induction, while in group C both MAP and HR significantly increased after intubation compared with baseline and before induction ($P<0.05$). There was no significant difference of plasma concentrations of norepinephrine and epinephrine between baseline and after intubation in group D ($P>0.05$). Plasma concentrations of norepinephrine and epinephrine increased significantly after endotracheal intubation in group C ($P<0.05$). Although plasma concentrations of norepinephrine and epinephrine between two groups were similar at baseline ($P>0.05$), both of them were statistically higher after intubation in group C than those of in group D ($P<0.05$).

Conclusions:

A single dose of dexmedetomidine given before induction of general anesthesia significantly decreased the stress hormone response to endotracheal intubation, kept hemodynamics more stable, and contributed to perioperative safety.

Key words:

dexmedetomidine; endotracheal intubation; stress response; hemodynamics;

Table1 Hemodynamic Parameters (means±SD)

Group	n	Baseline		Before Inducation		After Intubation	
		MAP (mmHg)	HR (Beats/min)	MAP (mmHg)	HR (Beats/min)	MAP (mmHg)	HR (Beats/min)
DEX	28	78.1±8.6	93.3±14.6	79.4±12.2	75.5±8.8	84.3±14.6	81±9.0
Control	25	80±6.8	84.2±13.9	73.6±9.5	79.3±11.0	89.9±13.9*	91.6±15.0*

* $P<0.05$, compared with baseline and before induction

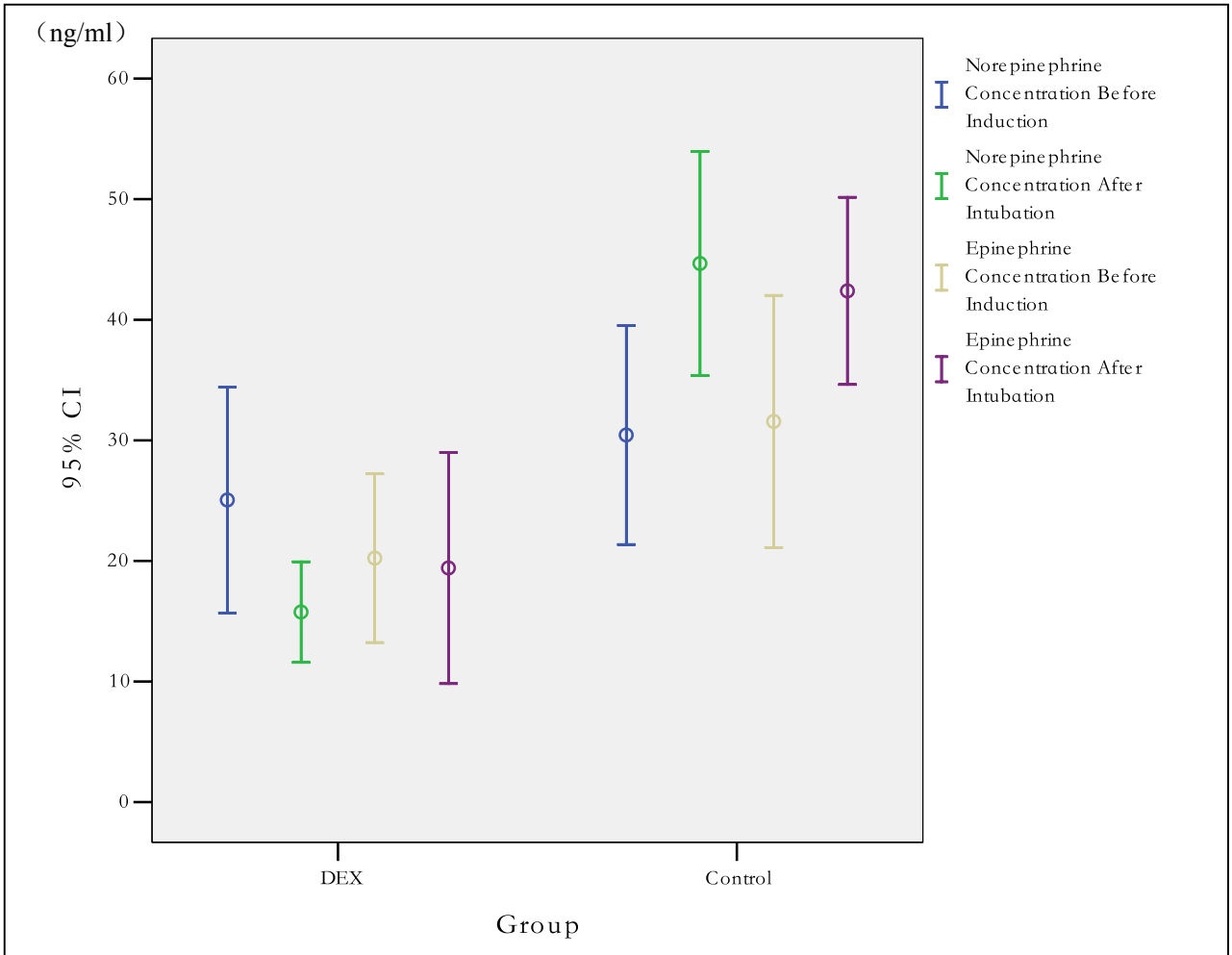

Fig1. Plasma Concentrations of norepinephrine and epinephrine