ORIGINAL RESEARCH PAPER

Medical Science

A STUDY OF HEMODYNAMICS WHEN DIFFERENT DOSES OF DEXMEDETOMIDINE IS USED WITH PROPOFOL AS AN INDUCING AGENT

KEY WORDS: Hemdynamics, dexmedetomidine, propofol.

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ABSTRACT

Intravenous dexmedetomidine is associated with a biphasic BP response. At low doses the dominant action of α2 adrenoreceptor agonist activation is a reduction in sympathetic tone, mediated by a reduction of noradrenaline release at the neuroeffector junction, and a inhibition of neurotransmission in sympathetic nerves . The net effect of dexmedetomidine action is a significant reduction in circulating catecholamine's with a slight decrease in BP and a modest reduction in heart rate. When administered as a continuous infusion, it is associated with a stable hemodynamic response. Significant hypotension is usually only observed in patients with pre-existing hypovolemia or vasoconstriction. The bradycardia frequently seen after the administration of dexmedetomidine may be due to the central sympatholytic action, enhanced vagal activity and partly by baroceptor reflex. Hemodynamic stability provided by α2 adrenoceptor agonists in the perioperative period leads to a reduction in perioperative myocardial ischemia.

Introduction:

Macewen, a Scottish surgeon, is credited with the first elective use of endotracheal intubation to administer anaesthesia in 1878. He performed an awake, digital, blind intubation under chloroform anaesthesia. Direct laryngoscopy was first performed in 1895 by Alfred Kirstein with a modified esophagoscope called autoscope . In 1913, Chevalier Jackson designed a laryngoscope and was the first to describe tracheal intubation under direct laryngoscopy. Sir Robert Macintosh (1897–1989) introduced the Macintosh curved laryngoscopic blade that has been in use since 1943. [1] In 1940, Reid and Brace first described hemodynamic response to laryngoscopy and intubation. [2] Since then various methods of attenuation of response to laryngoscopy and intubation are still in search. No single method has been established as the most appropriate for this purpose . [2] α2 adrenoreceptor agonists such as clonidine provide preoperative sedation and anxiolysis. Intraoperative use of α2 agonists is associated with improved hemodynamic stability, reduced sympathoadrenal responses to laryngoscopy, reduced anaesthetic requirement .They also reduce incidence of postoperative pain and analgesic requisites. [3] Dexmedetomidine , a recently introduced α2 adrenoreceptor agonists, is being used as a premedication in doses ranging from 0.33 to 1 µg/kg. [4,5,6] It has certain side effects of which most common are bradycardia and hypotension especially in presence of other concomitant factors[7]. Hence this study was conducted to compare and evaluate the effect of different dosages of dexmedetomidine on induction dose of propofol and hemodynamics.

Aims and Objectives:

To study the hemodynamics when different doses of dexmedetomidine is used with propofol as an inducing agent.

Materials and Methods:

This study was done in the Department of Anesthesia in A.J.Institute of Medical Sciences

This study was done using 60 patients. The study was done from July 2017 to June 2018.

They were divided into 4 groups
Group A received 1 µg/kg of dexmedetomidine.
Group B received 0.6 µg/kg of dexmedetomidine.
Group C received 0.3 µg/kg of dexmedetomidine.
Group D received 20 ml of normal saline.

Inclusion Criteria

1. The patients were aged between 30-50 years
2. The patients had no co-morbidites

Exclusion Criteria

1. Aged below 30 and above 50 years
2. Patients with co-morbidities

All the statistics were done using the SPSS software 2015 (California)

Results:

Graph 1: Heart Rate

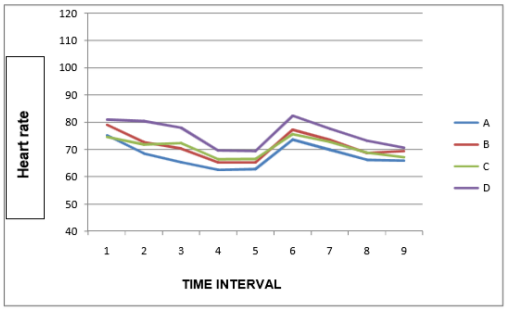
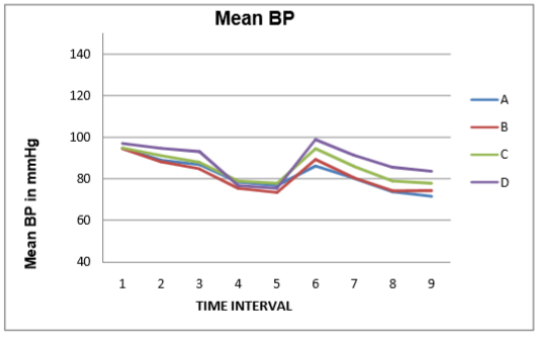
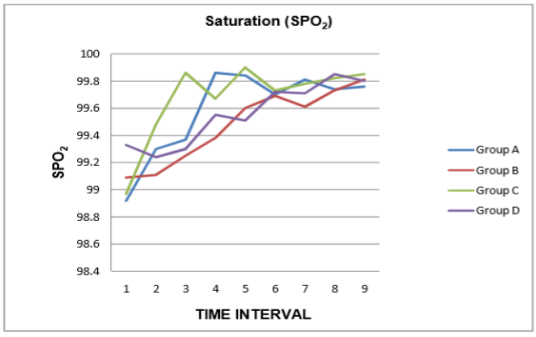


Figure -Heart rate

Graph 2: Mean Blood Pressure



Graph 3: Saturation



Note :Table 1

KEY FOR TIME INTERVALS

1. Baseline
2. 10 min post infusion
3. 20 min post infusion
4. Post induction
5. Before intubation
6. 1min post intubation
7. 2min post intubation
8. 5 min post intubation
9. 10 min post intubation

Discussion:

Significant intragroup ($p<0.001$) and intergroup ($p=0.001$) variations in heart rate were noted in the study population. Significant intergroup variations were noted at 10 minutes post infusion ($p<0.001$), 20 minutes post infusion ($p<0.001$), post induction ($p= 0.002$), before intubation ($p=.007$), 1 minute post intubation ($p= 0.001$), 2 minutes post intubation ($p=0.002$) and 5 minutes post intubation ($p=0.004$).

The study population displayed significant intragroup ($p<0.001$) and intergroup ($p=0.001$) differences in mean BP during period of observation. Significant intergroup variations were noted 10 minutes post infusion ($p=0.001$), 20 minutes post infusion ($p<0.001$),1 minute post intubation , 2 minutes post intubation, 5 minutes post intubation and 10 minutes post intubation($p< 0.001$).

There was no statistically significant difference in oxygen saturation between the four groups. Mean saturation remained above 98% in all four groups.

Conclusion:

Attenuation of hemodynamic response was best seen with 1 µg/kg followed by 0.6 µg/kg while hemodynamic profiles of 0.3 µg/kg of dexmedetomidine and placebo group were similar. Hence we conclude that 1 µg/kg and 0.6 µg/kg of dexmedetomidine offer desirable hemodynamics.

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