Haemodynamic Cardiovascular response of Fentanyl group Opioids in Paediatric Anesthesia: A Comparative Study of Fentanyl and Alfentanil among Chinese Patients

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BACKGROUND
Tracheal intubation in children is usually linked with a temporary haemodynamic cardiovascular response. The fentanyl groups of opioids usually attenuate the cardiovascular intubation response, when they are used in small doses. Fentanyl, an opioid analgesic and its analogue Alfentanil with strong agonist action at μ-opioid receptors are widely used among children while carrying out various surgical procedures. The basic aim of this study was to evaluate the efficacy of fentanyl and alfentanil in relation to haemodynamic stability of paediatric patients during routine general anesthesia and mutually compare while assessing the cardiovascular intubation response.

METHODS
A prospective clinical trial was conducted at Anesthesia department, Union Hospital, Tongji Medical College, Huazhong University of Science and Technology, Wuhan, China from June 2010 till December 2010. A total of 48 children aged 8.5±1.7 years, scoring ASA I-II, undergoing general anaesthesia were recruited. They were then randomly divided into two groups. Group A included participants who received fentanyl bolus injection while group B received alfentanil. Each group recruited 24 (50%) patients. The dose was adjusted to 1.5 μg/kg for both fentanyl and alfentanil. Induction, maintenance and recovery of general anaesthesia was performed while strictly following the ASA (American Society of Anaesthesia) guidelines. Haemodynamic parameters in terms of blood pressure and pulse were recorded before and after intubation. All the statistical analyses were performed by using SPSS version 15 and a P-value of less than 0.05 was considered significant.

RESULTS
There were no statistical difference among the gender, age and BMI of the participants among the two groups. Time to reach the maximum systolic BP (49±18 sec vs. 74±30 sec, 95% CI 1.542-2.781, P 0.02) and pulse (52±34 sec vs. 108±48, 95% CI 3.176-4.965, P 0.01) among group A was statistically significant and smaller than group B participants. In addition, the time for systolic BP (122±47 sec vs. 76±44, 95% CI 2.987-4.743, P 0.01) and pulse (128±32 sec vs. 57±22, 95% CI 3.126-5.102, P 0.01) to reach normal were also statistically significant among the two groups with being the higher values in group A. Pre-intubation, post-intubation, average (intra-operative) and maximal (peak value) of pulse, systolic BP and diastolic BP were all statistically significant (P<0.05) among the participants of the two groups reflecting that alfentanil keeps the undergoing subjects more haemodynamically stable with markedly reduced fluctuations in circulatory parameters.

CONCLUSIONS
Alfentanil group participants showed decreased values of pulse and blood pressures changes even with their peak values in comparison to the participants in Fentanyl group. There were minimal alterations in haemodynamic readings in the alfentanil group if compared with fentanyl received patients. An alfentanil 1.5-2 μg/kg bolus injection dose along with propofol in children provides a safe circulatory and haemodynamic balance with minimal cardiovascular response and a stable anaesthetic state.

KEY WORDS
Fentanyl, Alfentanil, Cardiac Response, Haemodynamic response

REFERENCES

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