The effect propofol and thiopental on neonate Apgar in induction of cesarean section Anesthesia: A comparative study

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Abstract: Neonatal Apgar reduction, at the beginning of childbirth, is one of the most important causes of postnatal death. The aim of this study is to compare the effect of thiopental with that of propofol on neonate Apgar cesarean and on their mothers hemodynamics. This prospective and double-blind clinical trial study was carried out on 108 women, who were divided in group I or group II according ASA (American Society of Anesthesialogist), whom were selected for cesarean section in Jahrom university of medical sciences hospitals. Anesthesia induced with thiopental and propofol in one group in another then these parameters were recorded: time interval of anesthetic induction to extraction of neonate Apgar score, 1 and 5 min after birth, the blood pressure of anesthetic induction, were delivered by a blood pressure problem before of endotracheal intubation, blood pressure were delivered by a after of neonate after extraction and were delivered by a pulse rate of anesthetic induction were delivered by a before and after. The results were analyzed using Spss software and T test. No statistically significant differences were found for vitality between the two groups of neonates ($P > 0.05$) but the hemodynamic changes of mothers showed significant differences in the two groups ($P < 0.05$). The result of this study showed that propofol can be more appropriate than thiopental for induction of anesthesia in caesarean section and has no effect on the hemodynamic changes and newborns Apgar score.

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1. Introduction

A large number of caesarean sections are done around the world per day. About 17% of Cesarean section with general anesthesia is administered in advanced countries (Miller., 2005).

There are some restrictions for anesthesiologists in cesarean section, including weakening effect of anesthesia drugs on the fetus. Hence they have to administrate drug with at least weakening effect on fetus and also reduce doses of the drug in general anesthesia in caesarean section (Birnbachl., 2005).

According to infants apgar score in first and fifth minutes after the birth is an important indicator in the next assessment in general anesthesia for cesarean section, this os more important to use a drug with which at least weakening effect on fetus (Marino et al., 2002).

Results of studies on comparison of Propofol and thiopental are controversial and some studies showed there is not significant differences between the use of propofol and thiopental and their effect on fetus and mother in general anesthesia for cesarean section:

A study by Siafaka showed propofol and thiopental had not significant difference effects on newborns' Apgar score during general anesthesia caesarean section (Siafaka et al., 1992).

Slanos study showed propofol can cause newborns Apgar reduction in first and fifth minute after birth (Celleno et al., 1998).

Kakinohanna reported that propofol can be helpful for anesthesia induction for emergency cesarean section in patients with asthma and is not harmful for infants (Kakinohana et al., 1999).

Walton and his colleagues found that the hemodynamic changes in propofol and thiopental anesthesia induction were not significant different (Valtonen et al., 1999).

Previous studies showed that propofol and thiopental have the same effect of newborns and mother's hemodynamic changes (Bazrkhah et al., 2008).

Due to differences of opinion about the possible side effects of the drugs used and their impacts on the Apgar score and dynamic conditions in mother and also due to the high incidence of general anesthesia in Iran, this is important more study in this field.

So we were prompted to investigate the effects of Propofol and thiopental on the 1st and 5th minutes Apgar in neonate and also on hemodynamic

conditions in mother in general anesthesia in Cesarean section.

2. Material and Methods

This study was approved by Ethics Committee of Jahrom University of Medical Sciences and the possible side effects of anesthesia and medicine and also the benefits and purpose of the study were described for patients (mothers).

This prospective and double-blind clinical trial study was carried out on 108 women, 15- 45 years old with gestational age 37- 40 weeks who were divided in group I or group II according ASA (American Society of Anesthesiologist), whom were selected for cesarean section in Jahrom university of medical sciences hospitals.

Patients with possible reasons indicating low apgar, such as fetal heart rate low, separation of placenta, Meconium, preterm embryo, towin pregnancy and as well as mothers who have underlying diseases, such as diabetes, high blood pressure, heart disease, kidney and thyroid diseases and mothers with drug addiction, alcohol and sedative drugs abuser were excluded.

The subjects were randomly divided into two groups of 54 people. induction of anesthesia in Patients in group 1 group 2 were done with thiopental sodium (5-6 mg/kg) and propofol (mg/kg2.5-2) respectively. Trachea intubation was done by suksinil kolin 1.5-2 mg/kg. Patients heart rate and blood pressure monitored regularly.

Isofluran 1.2%, Oxegene 50% and nitric oxide 50% were used for anesthesia maintenance. The injection time of anesthesia induction drug to the time of fetus leaving were measured and recorded.

Also on the mother's heart rate and blood pressure before and after induction of anesthesia and also before and after intubation were recorded.

The data was analyzed using SPSS software by paired test T and independent T test. $P < 0.05$ was considered as significant.

3. Results

The mean time interval between induction of anesthesia to leaving the embryo in group 1 (thiopental) and group 2 (propofol) were 3.20±4.28 minute and 3.40±0.09 minute respectively. This difference was significant, statistically (P= 0.000).

There were not significant differences between the first minute Apgar scores in thiopental and propofol groups and also there were not significant between and the 5th minute Apgar scores in these group (table.1).

Table.1: The first and the fifth minute Apgar scores in thiopental and propofol groups

	Group	Mean±SD	P. value
1st min. Apgar	thiopental	7.7±1.5	0.210
	Propofol	5.8±1.4	
5th min. Apgar	thiopental	9.0±0.7	0.26o
	Propofol	9.6±0.7	

The effect of thiopental and propofol on mothers hemodynamic changes in two groups have been summarized in table.2.

Table-2: The Comparison of mothers hemodynamic changes in two groups

	Group	Mean±SD	P. value
Mother's heart rate before induction of anesthesia	thiopental	2.112±14.8	0.900
	Propofol	6.107±13.2	
Mother's heart rate after induction of anesthesia	thiopental	3.124±14.8	0.0001
	Propofol	6.107±12.8	
Systole blood pressure before induction of anesthesia	thiopental	9.123±8.6	0.630
	Propofol	7.122±8.13	
Diastolic blood pressure before induction of anesthesia	thiopental	2.76±10.9	0.700
	Propofol	9.76±8.7	
Systole blood pressure after intubation	thiopental	2.143±14.6	0.0001
	Propofol	6.132±13.7	
Diastolic blood pressure after intubation	thiopental	3.87±12.2	0.008
	Propofol	81.5±8.9	
Systole blood pressure after leaving embryo	thiopental	6.120±8.9	.005
	Propofol	7.112±17.6	
Diastolic blood pressure after leaving embryo	thiopental	2.75±10.7	0.041
	Propofol	6.71±6.4	

4. Discussion

Caesarean section is the most common surgical operation in the world (Miller., 2005). Therefore the drug used for general anesthesia must have the lowest side effect on the fetus and newborn Apgar score, because Apgar score changes and its decrease are causes of newborns death (Miller, 2005).

The results of present study showed that the first minute Apgar score was in the fifth and did not have significant differences between thiopental and propofol groups, that this finding is similar to the results obtained from previous studies (Siafaka et al., 1992, Valtonen et al., 1999, Bazrkhah et al., 2008).

But these results inconsistent with the results obtained from the some studies (Miller., 2005).

Other results of present study showed that the mother's blood pressure and heart rate after induction of anesthesia and intubation in thiopental group has been more than propofol group. These results were consistent the results of previous studies (Bazrkhah et al., 2008). Some studies have rejected the changes in mother's dynamics (Valtonen et al., 1999).

On the other hand, some of the benefits of the drug propofol, including antiseptic properties, anti-vomiting and rapid recovery there is not in thiopental (Brinbach et al., 2005).

As well as the reactions to anesthesia induction with larynx after anesthesia induction by thiopental compared with equivalent amounts of propofol remain active and thiopental in rare cases cause brocospasm and laryngospasm (Miller., 2005).

According to specific features of propofol, it is generally safe in the caesarean section and lack of side effect in newborn and also according to the mother's hemodynamic changes being lower than the thiopental, this drug can be advised for induction of anesthesia in caesarean section operation.

The result of this study showed that propofol can be more appropriate than thiopental for induction of anesthesia in caesarean section and has no effect on the hemodynamic changes and newborns Apgar score.

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