ANTICHOLINERGIC PREMEDICATION FOR PREVENTION OF OCULOCARDIAC REFLEX DURING SQUINT SURGERY

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Background: Profound bradycardia during eye surgery is potentially serious event. In clinical practice this Oculocardiac Reflex (OCR) is most often encountered during squint surgery. The objective of this study was to assess the occurrence of OCR and prove the effect of anticholinergic premedication (atropine) to prevent OCR. **Methods:** This study comprises of sixty patients (age 2-30 years) operated for squint surgery under general anaesthesia. Cases were divided into two groups of thirty each. Group 1 was premedicated with intravenous injection of atropine and Group 2 did not receive any premedication. Patients were monitored during operation for any bradycardia or dysrhythmias. **Results:** The observed data showed occurrence of 70% OCR in Group 2 as compared to only 10% in Group 1. Severe bradycardia in 40% cases of Group 2 needed intervention by IV injection of atropine. **Conclusion:** Our study showed that atropine premedication in the patients of squint surgery under general anaesthesia definitely obtunds OCR and prevents any untoward effects of dysrhythmias during eye surgery.
Keywords: Oculocardiac Relex (OCR), squint surgery, atropine premedication

INTRODUCTION

A variety of stimuli arising in or near the eye especially following traction on the internal rectus or pressure on the eye ball may cause bradycardia, arrhythmias[1,2] and cardiac arrest.[3-6] In clinical practice this oculocardiac reflex (OCR) is most often encountered during squint surgery in children.[7-11] OCR is also seen during eye muscle surgery, repair of detached retina,[12] compression of gasserian ganglion[13], enucleation of eye[14] and by contact lens[15] and repair of nasal fracture under General Anaesthesia.[16] Prophylactic anti cholinergic is recommended[2,17-19] and adequate cardiac monitoring must accompany these interventions as immediate action may be required. OCR may be manifest by bradycardia, bigeminey, ectopic beats, nodal rhythm, AV block and cardiac arrest.

The present study was designed to asses the occurrence and severity of OCR in a series of patients undergoing squint surgery under general anaesthesia and the effect of preoperative administration of intravenous injectable atropine on OCR in our population.

MATERIAL AND METHODS

This study was undertaken in Ayub Teaching Hospital on sixty patients undergoing squint correction surgery of one or both eyes. All the patients were preoperatively examined, investigated and were admitted to the hospital one day prior to operation. The cases were divided into two groups of thirty each. Group I received Injection Atropine intravenous (15ug/Kg body Wt) on the operation table before induction of anaesthesia and Group II did not receive any anticholinergic premedication. The patients were induced either with intravenous thiopentone or with halothane by mask and intubated under the effect of Suxamethonium. All the patients were maintained on 60; 40 nitrous oxide, Oxygen mixture with 1- 1.5 % halothane through paediatric circuit or Bains circuit by controlled ventilation and injection pancuronium. (Pavulon.) Patients were monitored throughout the procedure. OCR was defined as slowing of 20% or more in heart rate over the averaged three successive beats. When severe bradycardia (pulse rate below 50 beats per minute) occurred with OCR, it was corrected by IV injection atropine (15 ug /kg). Data recorded included the incidence of OCR and any change from sinus rhythm during surgery.

RESULTS

The two groups were identical as regards age and sex (table-1). Mean maximal slowing, the incidence of juctional rhythm and number of patients requiring atropine during surgery was definitely higher in the second group who did not receive atropine as premedication. OCR was observed in 70% of the cases in Group II while as only 10 % cases of Group-I showed any evidence of OCR. (table-2). No ventricular dysrhythmias were seen at any time although junctional rhythms (12 cases in Group II) were common during eye muscle traction in Group II patients (table 3).

Table-1: Age of patients in years (n-60)

Group	Range	Mean
Group I	4-30	14.96
Group II	2-30	13.70

Table-2: Changes in Pulse Rate (n-60)

Change	Group I Cases (%)	Group II Cases (%)
No Change	6 (20)	3 (10)
Decrease (%)		
<20	6 (20)	3 (10)
20-30	3 (10)	3 (20)
>30		15 (50)
Increase (%)		
<10	10 (3.35)	3 (10)
11-20	5 (16.65)	

Table 3 Observed Parameters

Parameters	Group 1 Cases	%	Group 2 Cases	%
OCR	3	10	21	70
Juntional Rhythm	2	6.66	12	40
Severe Bradycardia	Nil		10	33.35

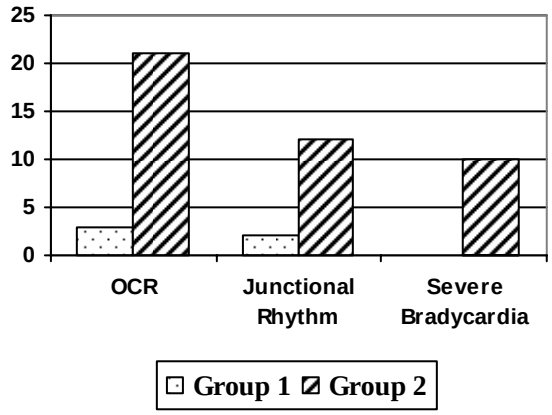

Figure-1: Comparison of Groups

DISCUSSION

OCR is a Trigeminovagal reflex characterized by clinical occurrence of bradycardia and other cardiac rhythm disturbances following manipulation on eye, especially after traction of external eye muscles. The afferent pathway is via ciliary ganglion to ophthalmic division of Trigeminal nerve and through Gasserian ganglion to main sensory nucleus in the fourth ventricle. The efferent pathway is via the Vagus Nerve. Profound bradycardia during ophthalmic surgery is not rare and is potentially serious event. Little is known about predictability of OCR. Arnold et al[20] have shown that discrepancy in heart rate sensitivity between surgical extra ocular muscle tension and ocular compression may be due to different sensory receptors and brain stem processing for trigeminally mediated OCR. Carotid sinus massage may help predict low heart rates during eye surgery. Superior rectus has a stronger reflex and diabetics are reflex insensitive.[21]

The retro bulbar block is effective in minimizing the occurrence of OCR whether under general or local anaesthesia.[22,23] Topical lignocain applied to eye muscles also significantly attenuates the OCR[24] and Grover and his colleagues[12] have shown that local anaesthesia produces less bradycardia and ectopic arrhythmia (14.4% as compared to 63.3) and is better than General anaesthesia for surgeries in which traction of extra ocular muscle is required. Rocuronium has been found to attenuate OCR during squint surgery in children anesthetized with halothane and nitrous oxide.[11]

In our study it was observed that atropine premedication definitely obtunds and prevents OCR in patients undergoing squint surgery under general anesthesia as also shown by Arnold and colleagues[19] and Mirakhur et al.[25] Anticholinrgic prophylaxis does not reduce incidence of emesis after strabismus surgery in children despite being effective against occurrence of OCR (2% in atropine group as compared to 55% in placebo control) 18 while as propofol with total intravenous anaesthesia leads to decreased incidence of emesis and PONV with early recovery but increases the incidence of bradycardia and higher frequency of OCR.[7,8,26,27] The incidence of severity of Bradycardia, dysrhythmia and need for atropine administration were greater in atracurium group than pacuronium group in the study by Loewinger et al.[28]

CONCLUSION

OCR is a trigeminovagal reflex commonly occurring during squint surgery and is characterized by bradycardia, ectopic beats, nodal rhythm and sometimes cardiac arrest. It is potentially a serious event and unpredictable. It can be prevented by prophylactic anticholinergic administration like atropine. The present study has proved it that preinduction IV atropine is effective against occurrence of OCR during squint surgery and must be used in all the cases of eye surgery though higher doses increase the side effects like dryness of mouth and tachycardia.[2] To avoid any untoward effect of OCR the authors would recommend monitoring of ECG, pulse oximetry, provide anticholinergic protection, encourage surgeon to be gentle and ensure adequate depth of anaesthesia during squint surgery.

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