

Treatment of Intraoperative Sinus Tachycardia with Neostigmine Methylsulfate

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Abstract: Background: Neostigmine is an anticholinesterase drug. Sometimes during operation, patient heart rate increased without known causes. **Materials and Methods:** We used intravenous neostigmine for control of sinus tachycardia during surgery. In this research 100 patients with class I, II ASA were selected within a period of time (29 months) for intraoperative treatment of sinus tachycardia. **Results:** The maximum effect of neostigmine in reducing heart rate were in 15 minutes after its injection with 29.3% and 29.4% reducing in heart rate of the patients with 1-12 y/o and 12-65 y/o respectively. **Conclusion:** The results of this study indicate intravenous injection of neostigmine in doses .0.01mg/kg can be useful in reducing intraoperative unknown sinus tachycardia in patients with different ranges of age.

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KeyWords: Neostigmine, Sinus tachycardia, Intraoperative

1-Introduction:

Neostigmine is classified as a cholinergic agent or parasympathomimetic agent (1). Its effects are similar to those of acetylcholine and acts by stimulating the parasympathetic nervous system (2). Cholinergic actions include slowing of the heart rate; increased gastrointestinal secretions and motility; increased secretions and contractility of bronchial smooth muscle; increased contractions of the urinary bladder with relaxation of muscle sphincter; increased force of skeletal muscle contraction; sweating; miosis (pupil constriction) and reduction of intraocular pressure; decrease in blood pressure(3,4). Neostigmine is used in the symptomatic control of Myasthenia Gravis and may be used postoperatively to treat or prevent urinary retention or distention (5,6). During the administration of anesthetic drugs Neostigmine may be given intraoperatively or post-surgically to reverse the effects of nondepolarizing neuromuscular blocking agents such as atracurium (7). Sometimes during operation under general anesthesia, patient heart rate suddenly increased without any known causes like pain, hypotension, hypoxia and acidosis. We used of intravenous neostigmine for intraoperative control of this kind of unknown sinus tachycardia.

2-Materials and Methods:

In this research 100 patients that taken general anesthesia for different kind of surgery were

selected within a period of 29 months. The inclusive criteria for the study were patients with class I and II (ASA), age between 1-65 years old and sinus tachycardia with unknown etiology. The exclusive criteria were patients with asthma, upper and lower respiratory tract infections and tachyarrhythmia.

During surgery under general anesthesia if heart rate of the patients increased and the causes of sinus tachycardia such as pain, hypovolemia, hypotension, hypoxia, hypercarbia, acidosis and light anesthesia were rolled out then intravenous neostigmine in doses 0.01mg/kg were injected slowly. Atropine was available at hand when injection of neostigmine was done. Patient's monitorings were ECG, pulse oxymeter, noninvasive blood pressure (NIBP) and esophageal or precordial estroscope.

3-Results:

The table-1 represents changes of heart rate in the different times of operation and different ages and sex (male, female) after injection of neostigmine. In patients with age between 1-12 y/o the maximum effect of neostigmine in reducing heart rate were in 15 minutes after its injection with 29.3% reducing in heart rate of the patients. In the patients with age between 12-65 y/o the maximum effect of neostigmine in reducing heart rate were 15 minutes after injection with 29.4% reducing in heart rate.

Table-1: Changes in heart rate in the different time of operations at different ages and sex

TIME(min)	Male Female n=100 1-65 y/o	Male Female n=30 1-12 y/o	Male n=14 1-12 y/o	Female n=16 12-65 y/o	Male Female N=70 12-65y/o	Female N=45 12-65y/o	Male N=25 12-65y/o
zero	139.3	147	144.9	147.9	136	137.6	133.2
1	137.7	145.6	143.2	147.8	134.4	136.1	131.4
2	131.1	139.1	136.7	139.7	128.6	130.3	125.7
3	124.2	123.1	121.2	124.8	124.8	126.4	124.7
4	119.9	121.4	120.7	122.1	119.3	121.7	115.2
5	114.2	118.3	115.1	121.2	112.5	114.8	108.5
7	107.6	113.2	110.6	115.6	105.2	108.1	100.2
10	99.5	104.2	100	108	97.6	100.1	93.1
15	98.4	104	99.9	107.7	96	99.2	90.5
20	98.6	104.2	100.1	107.7	96.2	99.3	90.7
25	98.6	104.3	100.1	108.1	96.2	99.4	90.6
30	99	104.6	100.2	108.5	96.6	99.7	91.1

4-Discussion:

The results of this study indicate intravenous injection of neostigmine in doses .0.01mg/kg can be useful in reducing intraoperative sinus tachycardia in patients with different ranges of age but its maximum effect is in male with age 1-12 years old. In this research in two patients following injection of neostigmine side effects occurred. One patient suffering wheezing and increase in secretions of lungs that had a history of upper respiratory tract infection and in another patient bradycardia developed in which it was treated with atropine.

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