

EFFECT OF PRE-OPERATIVE ADMINISTRATION OF ORAL ASPIRIN ON SUXAMETHONIUM INDUCED MYALGIA : COMPARATIVE STUDY

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ABSTRACT

Abstract : Objectives: A comparative study to evaluate effect of pre-operative administration of oral aspirin and precurarization (with pancuronium) in prevention of suxamethonium induced myalgia.

Methodology: Design and setting: Tertiary care teaching hospital. **Subjects:** The present study was carried out on 75 patients in age group of 16-65 years belonging to ASA grade I or II. The cases undergoing surgery under general anaesthesia where endotracheal intubation was considered desirable and in whom aspirin was not contraindicated.

Results: In entire case series of 75 patients, 52 (69.3%) had fasciculation. Out of them Group I patients has least i.e. 24% while group II and Group III had equal i.e 92 % of patients having fasciculation.

Conclusion: Preoperative aspirin 600mg orally 1 hr before operation effectively reduces Suxamethonium induced pain and avoid complications associated with pretreatment with non-depolarising agents.

Key words: Oral aspirin, Suxamethonium, Fasciculation.

INTRODUCTION

General myalgia after Suxamethonium administration is a frequent and troublesome complication. Suxamethonium is a commonly used short acting depolarizing muscle relaxant. It is a relaxant of choice when there is need for quick muscle relaxation of short duration example in endotracheal intubation, laryngoscopy, orthopedic manipulation. Though an excellent short acting depolarizing muscle relaxant of choice it still has inherent side effects like post operative myalgia, muscular fasciculations, hyperkalemia, increase in intra ocular and intra gastric pressure. Out of them post operative myalgia is the commonly encountered problem of all.

Pain is more in patients who are ambulant within 48 hours of operation. It is noticed that pain commonly affect the neck, shoulders, chest and subcostal region. In spite of many studies available the mechanism by which post suxamethonium pain is produced has not been established. Rise in lactic acid level in muscle^[1] and raised potassium level has

been cited as the cause of myalgia.^[1,2] Collier suggested primary event may be the disruption of delicate muscle spindles.^[3]

Depending upon the knowledge of generation of post suxamethonium pain attempts have been made to alleviate this pain. These include pretreatment with tubercurarine, gallamine,^[4] vecuronium, atracurium,^[5] vitamin,^[6] a small dose of suxamethonium,^[7] lignocaine and propanidid,^[8] dantrolene,^[9] diazepam (Fahmy et al,^[10,11] and calcium gluconate.^[12] The most common of all these is pretreatment with small dose of non depolarizing muscle relaxant before induction of anaesthesia but this process has difficulty in intubation and increase in dose requirement of suxamethonium.

The recently role of prostaglandin in post operative myalgia led Naquib et al (1986)^[13] and Howe et al (1988)^[14] to study successfully with prostaglandin inhibitors in prevention of post operative myalgia. They concluded that incidence of myalgia following administration of suxamethonium markedly decreased after administration of oral aspirin which

is a non steroidal anti-inflammatory drug and inhibit the synthesis of prostaglandins. It has analgesic and antipyretic action in addition to its anti-inflammatory effects. Other advantages being easy oral administration, low cost, easy availability and moreover it does not interfere with intubation.

The present study was carried out to find out the effect of oral aspirin in reducing the incidence of post operative myalgia caused by administration of suxamethonium and to compare it with precurarization (with pancuronium) and with a control.

MATERIAL AND METHODS:

The present study was carried out on 75 patients in age group of 16-65 years belonging to ASA grade I or II. The cases undergoing surgery under general anaesthesia where endotracheal intubation was considered desirable and in whom aspirin was not contraindicated. These patients were taken for study after consent.

The relatively short cases who were likely to be ambulatory within 12-24 hours were included so that post suxamethonium stiffness and pain could be clearly separated from the postoperative pain otherwise. Preoperative assessment was done in terms of history and clinical examination and routine investigations were done in every case.

Patients with history of myalgia, arthralgia, neuralgia, headache, torticollis were not included in the study. Patients on anticoagulant therapy, history of peptic ulceration and known sensitivity to aspirin and its derivatives were excluded.

Muscle fitness assessed in term of history of occupation, sports activity, hobbies and limitation of activity by illness and on that bases patients were divided into three categories as:

1. Light muscular workers:- Included the person with prolonged sitting in the office like students and doctors etc.
2. Moderate muscular workers:- This group consisted of drivers, mechanics, policemen etc.

3. Heavy muscular workers:- This group had farmers and labourers.

The division of the cases was done by dividing all the 75 patients into three groups of 25 each.

GROUP I

Patients in this group were precurarised by giving injection pancuronium 0.01 mg/kg body weight intravenously three minutes before commencement of induction of anaesthesia.

GROUP II

Patients in this group were given soluble aspirin (tablet Disprin) 600 mg orally one hour before induction of the anaesthesia.

GROUP III

No pretreatment was given.

Premedication:

All the patients were given injection Glycopyrolate 0.2mg intramuscularly half an hour before the induction of the anaesthesia. No sedative were added because of their interference with the result of the study.

General Anaesthesia

Standard Technique : Patients were induced with injection Thiopentone sodium 4-5mg/kg body wt. I/V followed by injection suxamethonium 1 mg/kg body wt I/V. Anaesthesia was maintained with 67% Nitrous Oxide and 33% oxygen supplemented with Halothane and Intravenous Pentozocine if required. Endotracheal intubation was done. Non-depolarizing muscle relaxant of appropriate duration of action will be employed when controlled ventilation of lungs was required.

Variations as per group of study: The anaesthesia was given according to standard technique in Group II and III. Pre-operative oral aspirin (Tablet Disprin) 600mg was given in Group II one hour before induction of anaesthesia. In Group I precurarization by giving injection pancuronium 0.015 mg/kg body wt intravenously three minutes before commencement of induction of anaesthesia. Then injection

Thiopentone sodium 4-5 mg/kg body wt I/V followed by injection suxamethonium 1.5 mg/kg body wt I/V was given to facilitate the intubation of trachea. Maintenance of anesthesia was done as in standard technique.

Monitoring: Patient's vital functions Blood Pressure, Pulse rate and SpO₂ were recorded every

5 minutes. Patients were observed for Fasciculation, intubation difficulty, post-operative pain and other complications

Fasciculation: Onset, grade, duration and site were noted. The degree of muscular Fasciculation was observed and graded on four point scale.^[15]

Nil	Absent
Mild	Fine Fasciculation of the eyes, face, neck, fingers without movement of limbs
Moderate	Fasciculation of greater intensity at more than two sites or movement of limbs
Severe	Vigorous sustained and widespread Fasciculation

Intubating conditions: In three groups were recorded. [16]

GRADE I	Excellent	Easy and no reaction
GRADE II	Satisfactory	Vocal cord movement present
GRADE III	Fair	Vocal cord movement present and moderate reaction (vomiting, coughing and mild muscular movement)
GRADE IV	Poor	Impossible without supplementation

The patient's blood pressure, pulse rate and SpO₂ were recorded throughout operation. Every precaution was taken to prevent the fall of any body part during operation, any abnormal posture or movement during shifting of the patient to the ward. Patients were visited at 24 hours and 48 hours

post-operatively. Time taken till the patient became ambulatory was recorded. Complaints of pain and stiffness except in the vicinity of operation or injection site, the exact site or sites were determined. Accordingly grading of post-operative muscle pain was done on four point scale^[17]

Nil	No muscle pain or stiffness
Mild	Muscle pain on questioning only on one side but not causing any disability or limiting activity
Moderate	Muscle pain spontaneously claimed by the patient and on more than one site
Severe	Affecting more than one site causing disability or limiting activities and difficulty on getting out of bed or turning head

Post-operative mobility and analgesic requirement and any other complaints such as nausea, vomiting were also recorded.

RESULTS:

Statistical analysis – Chi square distribution method was applied to see relationship between various groups.

All the patients were of age group 16-65 years, out of them maximum 26(34.6%) belonged to age group 26-35 years and minimum i.e. 3(4%) were from age group 55-65 years. Of all the 75 patients there were 46(61.3%) male patients and 29(38.6%) were

female patients, which was statistically insignificant.

In entire case series of 75 patients, 52 (69.3%) had fasciculation. Out of them Group I patients has least i.e. 24% while group II and Group III had equal i.e 92 % of patients having fasciculation.

Group	Incidence	No fasciculation	Mild fasciculation	Moderate fasciculation	Severe fasciculation
I	06(24%)	19(76%)	06(24%)	-	-
II	23(92%)	02(8%)	14(56%)	07(28%)	02(8%)
III	23(92%)	02(8%)	12(48%)	07(28%)	04(16%)
Total	52(69.3%)	23(30.6%)	32(42.6%)	14(18.6%)	06(8%)

Table I Showing Incidence of Fasciculations of Suxamethonium in all groups

Group	Incidence	Mild Pain	Moderate Pain	Severe Pain
I	07(28%)	04(16%)	03(12%)	-
II	08(32%)	05(20%)	03(12%)	-
III	17(68%)	10(40%)	07(28%)	-
Total	32(42.6%)	19(25.3%)	13(17.3%)	-

Table II Showing Incidence and severity of muscle pain in all groups

In endotracheal intubation 22 patients (29.3%) had difficulty, which was maximum 44% in group I, group II (16%) and group III (28%) which was statistically significant. The overall mean duration of anesthesia was 42.3 minutes. The longest duration being 72 minutes and shortest was 16 minutes. Majority of cases (51) had duration of anesthesia between 31 to 60 minutes. 32 of total 75 patients (42.6%) suffered from muscle pain, in group I it was 28% and in group II it was 32% while in group III it was 68% and was statistically significant.

Most of patients (71) became ambulatory within 12-24 hours. Only 4 patients became ambulatory within 24-48 hours. While 32 patients suffered from muscle pain only three patients complained of pain after 24 hours. 19 patients suffered from mild pain and analgesics were given to seven patients while 13 suffered from moderate pain and five cases received analgesics. Analgesia was given in form of injection Fortwin (IV).

In other postoperative complication two cases complained of nausea, six of vomiting while four had fever when they were interviewed in ward.

DISCUSSION:

Suxamethonium provides a rapid and profound relaxation but for a short period. The useful relaxant has some disadvantages out of which muscle stiffness and pains have been posing a common problem. Pain is always hard to evaluate because of subjective factors involved. This study is another effort to ascertain the possible usefulness of two methods to prevent suxamethonium muscle pain.

Incidence of muscle pain: In group I 24% of patients had fasciculations and pain was present in 28% (7 out of 25) which means that fasciculations and muscle pain do not had any linear relation. Similar study by J.Wig and Bali showed precuarization reduced the incidence of fasciculations by 10-40% and muscle pain 10-30%.^[22] The group III showed incidence of fasciculations 100% and Pain 70-100%.

In group II 92% of patients had fasciculations and pain was present in 32% (8 out of 25) which means that fasciculations and muscle pain do not had any linear relation.

Patients in group III (control) were given anesthesia as in standard technique. There was high incidence of pain 68%(17 out of 25) in this group which was similar as reported by Churchill-Davidson, (66% out patients);^[18] Morris and Dunn, (72% out patients),^[18] Mayrhofer, (89%).^[19] The findings of present study were at variance with those of Hegarty, as 25.6%.^[20] The low incidence of muscle pain was because the cases of old age group and greater number of cases did not get up till third post-operative day. Bush and Roth showed the incidence of muscle pains as 10%.^[21] Those cases were of age group 5-10 years. This low incidence of pain in children is attributed to their rapid circulation reducing the period of fasciculation.

Onset and Duration of Pain: The appearance of pain was maximum within 12-24 hours of operation in all three groups. In Group I seven out of 25 cases suffered from muscle pain in 12-24 hours. Group II

seven cases suffered from muscle pain in 12-24 hours while only one patient complained of pain after 24 hours. In Group III 15 cases suffered from muscle pain in 12-24 hours while only two patients had it after 24 hours. Parbook and Pierce reported most of their patients developed pain within 24 hours.^[23]

Out of 75 cases 32 cases suffered from muscle pain, 29 had duration upto 24 hours and only 3 patients complained of pain after 48 hours. Churchill-Davidson claimed persistence pain beyond third day was unusual except for severe cases.

In most of patients pain was present at more than one site. Commonest sites were back, neck, shoulder, subcostal region and limbs. Muscle pain occurred invariably in more than one site (Churchill-Davidson, Hegarty). Lamoreaux and Urback (1959) described chest as the commonest site which was similar to our study regarding distribution of muscle pain.^[24]

Maximum incidence of pain was in age group 16-25 years, 15 out of 24 (62.5%), followed by 42.3% in 26-35 years and 37.5% in 46-55 years and minimum in 36-45 years (14.2%). Foster, 1960 detected low incidence of muscle pain in extremes of ages which may have some bearing with muscle activity. There was no difference in incidence corresponding with age in range of adolescent to 50 years (Leatherdale et al, 1959).^[25]

Incidence of pain was more in female patients 17 out of 29 cases (58.5%) as compared to male patients 15 out of 46 (33%). Results were similar to other studies by Hegarty, 1956, Leatherdale et al, 1959 believed muscle pain more likely in sedentary patients and Bush and Roth, 1961 found sex variations even in children. In our study in female highest incidence of pain was in group III (80%) followed by group I (55.5%) and group II (40%). In male it was 60% in group III, 26.6% in group II and 12.5% in group I.

Fasciculations were present in 52 of 75 cases (69.3%) out of them six suffered from severe fasciculations, 14 from moderate degree and 32 cases suffered from mild degree of fasciculations.

Out of these 52 cases, only 25 cases (48%) had muscle pain while the seven (of 32 total patients having pain) had muscle pain without fasciculations. The results suggested no definite correlation between muscle fasciculation and pain which were similar to finding of other studies.^[26,27]

CONCLUSION:

Preoperative aspirin 600mg orally 1 hr before operation effectively reduces Suxamethonium induced pain and avoid complications associated with pretreatment with non-depolarising agents.

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