Original Research Article

To Assess Post Anesthesia Pulmonary Complications after Use of Muscle Relaxants: An Institutional Based Study

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Received: 10-07-2021 / Revised: 10-10-2021 / Accepted: 16-10-2021

Abstract

Background: Incomplete return of neuromuscular function is associated with an increased risk of impaired respiratory and airway control, risk of aspiration and postoperative hypoxic events and pulmonary complications. Therefore, measures have been proposed to avoid residual neuromuscular block postoperatively. The present study was conducted to assess post anesthesia pulmonary complications after use of muscle relaxants. **Materials and Methods:** The present prospective observational cohort study was conducted to assess post anesthesia pulmonary complications after use of muscle relaxants. The sample size of the study was 120 patients. Patient characteristics, medical history, surgical and anaesthetic details (including management of neuromuscular function), postoperative physical examination, and chart review at discharge were collected. The study outcome was the incidence of postoperative pulmonary complications from the end of surgery up to postoperative day 28. **Results:** In the present study total sample size was 120 patients in which 55% were females and 45% were males. Maximum patients belong to age group 40-50yrs (41.66%). Any postoperative pulmonary complication found in 10.83% patients, Intermediate or severe postoperative pulmonary complication found in 6.66% patients, No postoperative pulmonary complication found in 82.5% patients. **Conclusion:** The present study concluded that any postoperative pulmonary complication found in 10.83% patients, Intermediate or severe postoperative pulmonary complication found in 6.66% patients, no postoperative pulmonary complication found in 82.5% patients.

Keywords: Pulmonary Complication, Neuromuscular Blocking Agents, Muscle Relaxants.

Introduction

The use of neuromuscular blocking agents (NMBAs) in routine surgery may be associated with significant adverse respiratory outcomes postoperatively[1,2].Recent outcome studies suggest that perioperative management of neuromuscular block, including use of neuromuscular transmission monitoring and/or administration of reversal agents, may affect early postoperative outcomes and length of stay in the postanaesthesia care unit[2-4]. Incomplete return of neuromuscular function is associated with an increased risk of impaired respiratory and airway control[5], risk of aspiration and postoperative hypoxic events[4] and pulmonary complications [1,2].Therefore, measures have been proposed to avoid residual neuromuscular block postoperatively, including the use of neuromuscular monitoring[6], administration of reversal agents to antagonise residual neuromuscular block (eg, neostigmine)[7],and even avoidance of neuromuscular blocking agents[8]. These measures alone or in combination[9] have been shown to reduce the incidence of residual neuromuscular block in the immediate postoperative period[10,4]. However, there is no evidence that any of these measures improves postoperative respiratory outcomes [2,11].The present study was conducted to assess post anesthesia pulmonary complications after use of muscle relaxants.

Materials and Methods

The present prospective observational cohort study was conducted to assess post anesthesia pulmonary complications after use of muscle relaxants. Informed written consent were taken from the patients.

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The sample size of the study was 120 patients. Patients (aged ≥18 years) receiving general anaesthesia for any in-hospital procedure except cardiac surgery were included. Primary exclusion criteria were surgery at a remote location (eg, outside of the operating theatre), scheduled hospital discharge within 12 h after surgery, preoperatively intubated trachea, preoperatively scheduled admission to an intensive care unit postoperatively, and surgery or anaesthesia (or both) within the last 7 days or scheduled within the next 7 days. Secondary exclusion criteria were tracheal extubation more than 6 h after the end of surgery and unplanned hospital discharge within 12 h after surgery. When a neuromuscular blocking agent is used for tracheal intubation the dose is selected in terms of the effective dose that would be needed to produce 95% neuromuscular block for that drug (ED 95). Patient characteristics, medical history, surgical and anaesthetic details (including management of neuromuscular function), postoperative physical examination, and chart review at discharge were collected. The study outcome was the incidence of postoperative pulmonary complications from the end of surgery up to postoperative day 28. A postoperative pulmonary complication was assumed if at least one postoperative pulmonary event was observed on physical examination done during the anesthetist's postoperative round or on review of the patient's chart after they had been discharged from hospital.

Results

In the present study total sample size was 120 patients in which 55% were females and 45% were males. Maximum patients belong to age group 40-50 yrs (41.66%). Any postoperative pulmonary complication found in 10.83% patients, Intermediate or severe postoperative pulmonary complication found in 6.66% patients, no postoperative pulmonary complication found in 82.5% patients.

Table 1: Demographic factors of the patients

Variables	N (%)
Age(yrs)	
≤40	22 (18.33%)
>40-60	50 (41.66%
>60-80	38 (31.66%)
>80	10 (8.33%)
Gender	
Male	54 (45%)
Female	66 (55%)
ASA classification	
1	32 (26.66%)
2	65 (54.16%)
3	18 (15%)
4-5	5 (4.16%)

Table 2: Postoperative complications

Outcomes	N (%)
Any postoperative pulmonary complication	13 (10.83%)
Intermediate or severe postoperative pulmonary complication	8 (6.66%)
No postoperative pulmonary complication	99 (82.5%)

Discussion

Neuromuscular blocking agents (NMBAs) are usually administered during anesthesia to facilitate endotracheal intubation and/or to improve surgical conditions. NMBAs may decrease the incidence of hoarseness and vocal cord injuries during intubation and can facilitate mechanical ventilation in patients with poor lung compliance[12-16].

In the present study total sample size was 120 patients in which 55% were females and 45% were males. Maximum patients belong to age group 40-50yrs (41.66%). Any postoperative pulmonary complication found in 10.83% patients, Intermediate or severe postoperative pulmonary complication found in 6.66% patients, no postoperative pulmonary complication found in 82.5% patients.

A second large cohort study was reported by McLean et al. in 2015[17].These authors found a statistically significant association between NMBAs and PPCs and that risk seemed dose dependent.

Another observational cohort study of the effects of NMBAs on postoperative pneumonia in patients was reported by Bulka et al. in 2016. They found that there was a statistically significant increase in postoperative pneumonia for patients receiving an NMBA compared with patients who did not (odds ratio 1.79) and for patients who received an NMBA but did not receive a reversal agent compared with patients who received an NMBA and a reversal agent[18].

In 2012, a large observational cohort study by Grosse-Sundrup et al. found that postoperative hypoxia (< 90% saturation) and reintubation requiring unplanned admission to the intensive care unit within 7 days of surgery were significantly increased in the group receiving an NMBA; respective odds ratios were 1.36 and 1.40[2].

Conclusion

The present study concluded that any postoperative pulmonary complication found in 10.83% patients, Intermediate or severe postoperative pulmonary complication found in 6.66% patients, no postoperative pulmonary complication found in 82.5% patients.

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Conflict of Interest: Nil
Source of support:Nil