Thesis on Incidence ,Severity and Associated factors of Post Suxamethonium Myalgia Among adult surgical patients at Tikur Anbessa Specialized Hospital, Addis Ababa, Ethiopia:

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Acronyms

PSM- post suxamethonium myalgia

NDNMB- non depolarizing neuromuscular blocker

NPS- numerical pain scale

TASH- tikur anbessa specialized hospital

1. Abstract

Background: Post-suxamethonium myalgia (PSM) is a common complication following the use of suxamethonium for rapid sequence induction. It leads to discomfort and may delay postoperative recovery, yet there is limited data on its burden in the Ethiopian surgical settings.

Objective: To assess the incidence, severity, and factors associated with post-suxamethonium myalgia among adult patients undergoing elective and emergency surgeries under general anesthesia**.**

Methods: A cross-sectional study was conducted among 144 adult surgical patients at Black lion comprehensive specialized hospital,from dec 2024-march 2025. Data were collected using structured interviews and chart reviews. Severity of myalgia was assessed using a standardized grading scale(NPS) within 48 hours postoperatively. Multivariable logistic regression was employed to identify factors associated with PSM**.**

Results: The overall incidence of post-suxamethonium myalgia was 42.6.%. Among affected patients, 23.85% experienced moderate pain and 18.75% reported mild pain. Myalgia most commonly developed within 6–12 hours postoperatively (34.7%) and typically lasted 1–2 days (30.8%). Underweight patients were more likely to experience PSM (AOR = 4.7; 95% CI: 2.62–11.27, p = 0.01), as were those induced with ketamine compared to propofol (AOR = 2.4; 95% CI: 2.07–8.2, p = 0.05). Age, sex, ASA class, and suxamethonium dosing were not significantly associated with PSM.

Conclusion: Post-suxamethonium myalgia remains a common postoperative complication. Being underweight and ketamine induction were independently associated with increased risk. Anesthesia providers should consider these factors when planning induction strategies to minimize patient discomfort.

2.Introduction

2.1 Background

Post-suxamethonium myalgia (PSM) is a frequently reported postoperative complication manifesting as muscle soreness and stiffness, often affecting patient comfort and recovery[1]. Suxamethonium chloride, a depolarizing neuromuscular blocking agent (NMBA), is widely utilized for rapid sequence intubation due to its rapid onset and short duration of action [1]. However the administration of suxamethonium is consistently linked to the development of postoperative muscle pain,typically emerging within 24 hrs and lasting upto 72 hrs[2,3] . The pain is usually localized to the neck, shoulder, upper abdomen, arm, back and leg area . The precise pathophysiology of PSM remains unclear,but current theories suggest that it involves biochemical changes such as increased intracellular calcium,membrane phospholipid degradation and free radical release.These processes may lead to enhanced muscle membrane permeability and damage associated with the fasciculation.Various studies have explored methods to mitigate PSM, including the use of vitamin C to reduce the severity of muscle pain associated with suxamethonium administration [2, 4]. Additionally, research has shown that pre-treatment with non-depolarizing muscle relaxants like Rocuronium can help reduce post-succinylcholine muscle fasciculations and myalgia, with minimal impact on serum potassium levels [3, 5-8].

Globally reported Post-suxamethonium myalgia (PSM) prevalence varies from 10% to 89%,depending on the population, dose of suxamethonium preexisting muscle conditions and anesthetic protocols used.Despite its recognized impact,standardized prevention protocols are lacking. Better understanding of the predictors and presentation of PSM is therefore vital for improving patient safetety and outcomes,particularly in settings where suxamethonium remains a standard induction agent.

Furthermore, the severity of post-suxamethonium myalgia (PSM) significantly impacts patient recovery and satisfaction. Understanding the severity of post-suxamethonium myalgia (PSM) is indeed crucial for optimizing patient care and improving outcomes. Research has shown that patients experiencing severe PSM may have prolonged recovery times and increased analgesic requirements compared to those with mild or no muscle pain [1, 2, 9]. By comprehensively assessing and addressing the severity of PSM, healthcare providers can tailor interventions to improve patient outcomes and enhance recovery processes.

The existing literature highlights the significance of investigating postoperative complications in surgical patients, including myalgia induced by various factors such as succinylcholine. Studies conducted in Ethiopia have shown high rates of postoperative myalgia, with one study reporting a 39.3% incidence rate of succinylcholine-induced myalgia [5]. These findings underscore the importance of dedicated studies to assess the specific incidence and severity of succinylcholine-induced myalgia at Tikur Anbessa Specialized Hospital, emphasizing the need for tailored approaches to postoperative pain management and complication prevention in this setting.

Therefore, this study aims to fill this research gap by determining the incidence and severity of post suxamethonium myalgia among patients undergoing surgery under general anesthesia at Tikur Anbessa Specialized Hospital. By identifying the factors associated with the development of this condition, strategies can be developed to mitigate its occurrence and improve patient outcomes. This research will contribute to the existing body of knowledge by providing valuable insights into the prevalence and impact of post suxamethonium myalgia in the context of Ethiopia.

2.2 Statement of the Problem

Post suxamethonium myalgia, also known as succinylcholine-induced muscle pain,remains a common but often overlooked adverse effect of suxamethonium. Despite its prevalence, there is limited research on the incidence and severity of post suxamethonium myalgia in Ethiopia, specifically at Tikur Anbessa Specialized Hospital, Addis Ababa. Understanding the prevalence and impact of this condition is crucial for optimizing patient care and improving outcomes.

Recent studies have investigated the incidence and risk factors associated with post suxamethonium myalgia. In a meta-analysis of 52 RCTS (from ASA publications)[26] incidence of myalgia at 24 hours was 50% . A study conducted to assess the magnitude and associated factors of postoperative myalgia among patients who undergo surgery in Wolaita Sodo Teaching and Referral Hospital, Southern Ethiopia found that the magnitude of postoperative myalgia was higher at 12 hours postoperatively, with 36% of patients experiencing mild pain, compared to 28% at 24 hours postoperatively. Additionally, 54% of patients did not experience postoperative myalgia at 12 hours [9]. Patients who did not receive a pretreatment agent before Suxamethonium administration were 15 times more likely to develop postoperative myalgia at 12 hours postoperatively compared to those who received pretreatment [9]. Additionally, the incidence and intensity of post-operative myalgia are linked to the type of muscle relaxant used, with magnesium sulfate and preservative-free lignocaine demonstrating better efficacy in reducing myalgia compared to atracurium and vecuronium bromide [12, 14]. A higher suxamethonium dose and longer administration duration, along with adjunct medications, are potential factors linked to postoperative myalgia. Study emphasizes their impact on muscle pain occurrence [4].
However, there is a lack of research specifically focusing on the Ethiopian population.

2.3 Significance of the Study

Post-suxamethonium myalgia (PSM) presents a persistent challenge in perioperative pain management In resource limited settings like Ethiopia, the absence of local epidemiological data hampers effforts to anticipate, prevent and manage this complication effectively.

This study holds significant value for several key reasons:

Fills a Knowledge Gap: There is no enough data on the specific incidence and severity of PSM among Ethiopian patients receiving suxamethonium at Tikur Anbessa Specialized Hospital. This study aims to bridge this gap and provide valuable insights into the local burden of PSM.

Improve anesthestic Practices: Understanding the incidence and severity of PSM in the local context may support the adoption of safer induction strategies, including the use of defasciculating doses or alternative neuromuscular blockers.

Identifies Potential Risk Factors: By investigating demographic and clinical factors associated with PSM, the study can identify high risk patients. This knowledge can be used to tailor anesthetic approaches to reduce the occurrence of PSM in vulnerable populations.

Guides Future Research: The findings can help as foundation for interventional studies testing preventive measures or alternative drug protocols,particularly in low resource settings like ours.

Improves Patient Care: With better risk anticipation and analgesic planning, providers can reduce patient discomfort, improve postoperative recovery and increase overall satisfaction with anesthesia care.

In conclusion, this study can provide actionable knowledge to improve perioperative care ,promote patient centered anesthesia and guide clinical policies for better outcome in Ethiopian surgical patients particularly at TASH.

3.Operational definitions

3.1.Myalgia-is a subjective muscle pain or soreness experienced by a patient

3.2.Post suxamenthonium myalgia(PSM): is a muscle pain or discomfort that occurs within 24-48 hrs after administration of suxamethonium,localized to one or more of the following

regions:neck,shoulders,back,upper abdomen or limbs and not attributable to other causes(e.g. surgical trauma,prolonged positioning during surgery or preexisting pain).

3.3.Chronic pain-pain that persists or recurs for more than 3 months

3.4 Numerical pain scale(0-10); Mild-is pain with score of 1-3

Moderate is pain with score of 4-6

Severe is pain with score of 7-10

4. Objectives

4.1 General Objective

To determine the incidence, severity and associated factors of post-suxamethonium myalgia (PSM) among adult surgical patients receiving suxamethonium for tracheal intubation at Tikur Anbessa Specialized Hospital, Addis Ababa, Ethiopia.

4.2 Specific Objectives

- To determine the proportion of adult surgical patients (aged 18-65 years) receiving suxamethonium for tracheal intubation who develop PSM (within 72 hours of surgery at Tikur Anbessa Specialized Hospital.
- To measure the severity of PSM, as measured by a numeric pain scale (NPS) score (0-10), at 6 hours, 12 hours, and 24 hours following surgery in adult surgical patients (aged 18-65 years) who receive suxamethonium for tracheal intubation at Tikur Anbessa Specialized Hospital.
- To identify demographic (age, gender) and clinical risk factors associated with the development or severity of PSM in adult surgical patients (aged 18-65 years) receiving suxamethonium for tracheal intubation at Tikur Anbessa Specialized Hospital.

5. Literature Review

5.1 **Introduction**

Post-suxamethonium myalgia (PSM) is a notable postoperative complication characterized by muscle soreness and stiffness occurring after administration of suxamethonium, a depolarizing neuromuscular blocker used for rapid sequence intubation. The myalgia often begins within 24 hours postoperatively and can persist up to 72 hours, and can hinder recovery, mobilization, and patient satisfaction. Despite its clinical relevance, the incidence and severity of PSM remain unstudied in many low-resource countries, including Ethiopia.

5.2 Local Evidence on Incidence and Severity of PSM in Ethiopia

While PSM has been reported in various Ethiopian settings local studies remain few and limited in scope.At Wolaita Sodo Teaching and Referral Hospital reported that 36% of patients experienced mild myalgia at 12 hours postoperatively, which declined to 28% at 24

hours. Notably, patients who were not given a pretreatment agent before suxamethonium administration were found to be 15 times more likely to develop myalgia than those who did [9].

At Tikur Anbessa Specialized Hospital, a prospective study revealed that intravenous lidocaine significantly reduced both the incidence and severity of PSM among surgical patients(42.9% against 53.3% for mild myalgia,and 15.8% versus 84.3% for moderate myalgia[5]. Similarly, research from Debre Markos Comprehensive Specialized Hospital, prophylactic administration of lignocaine and vecuronium was associated with reduced rates of PSM, with vecuronium having slightly better protection (The rate of mild-to-moderate postoperative myalgia in the vecuronium bromide group was 23.7%, 30.9%, and 16.4% in the first 6th, 24th, and 48th hours, respectively (p-value 0.001), as opposed to 0%, 37.3%, and 9.1%, respectively (p-value 0.008) in the group receiving preservative-free 2% plain lignocaine hydrochloride) [17]. Additional cross-sectional study from Debre Tabor Hospital also documented a high prevalence of suxamethonium-induced myalgia,with 39.8% being moderate(NPS) (41.9%) [19].

These findings indicate the presence of high burden of PSM calling for dedicated research in the area.

5.3 Global Incidence and Severity of PSM

Internationally, the reported incidence of PSM ranges from 10% to 89%, depending on variations in patient populations,anesthesia techniques, and use of preventive meassures[19–21]. A meta-analysis of 52 randomized controlled trials (RCTs) showed that the pooled incidence of myalgia 24 hours after surgery was approximately 50%, with pain severity often falling within moderate range ,around 10% reported severe pain [25].

The severity of PSM also shows wide variability. While most patients report mild to moderate pain, severe myalgia—rated above 7 on numeric pain scale (NPS)—is not uncommon, particularly in those receiving high doses of suxamethonium without pre-treatment [4,12,25]. The affected regions typically include the neck, shoulders, back, abdomen, and limbs.

5.4 Associated Risk Factors

Several patient-related and procedural factors have been identified in the development of PSM.Demographically,Younger age, female gender, and higher BMI have consistently been associated with increased risk [12,23]. Patients with a previous history of PSM or general myalgia are also at heightened risk of recurrence [9,22]. Procedural characteristics like the typeand duration of surgery and may further influence the incidence and severity of symptoms.

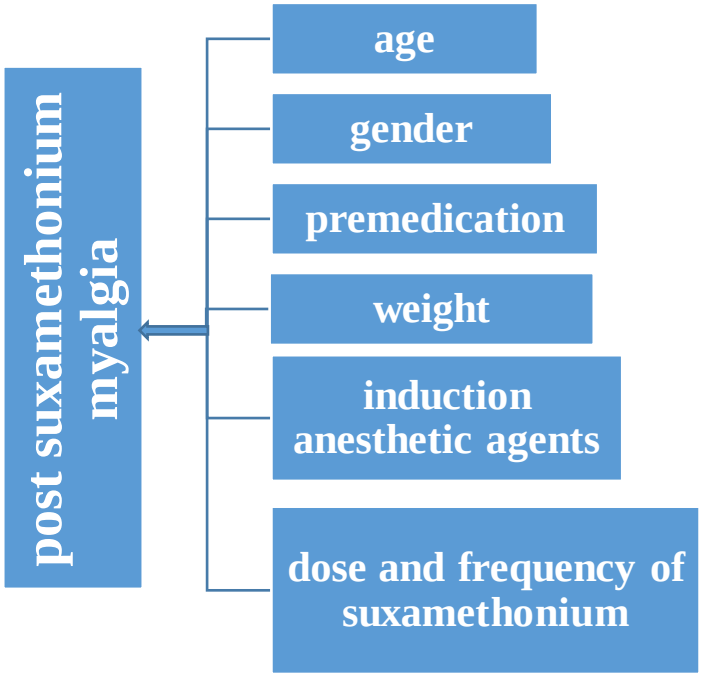
Anesthetic techniques plays a crucial role. Higher or repeated doses of suxamethonium, and lack of pretreatment with non-depolarizing neuromuscular blockers (NDNMBs) have been consistently linked with higher rates of PSM.[25]. Pretreatment with vecuronium, atracurium, or magnesium sulfate has shown effectiveness in reducing both fasciculations and subsequent myalgia [14,18,24]. Lidocaine, administered intravenously, also significantly reduces PSM and is commonly recommended [5,6,8].

Adjuncts such as Vitamin C have demonstrated benefit in decreasing muscle soreness potentially via antioxidant pathways[2]. Additionally, propofol-based maintenance anesthesia has been associated with lower rates of PSM due to membrane stabilization and decreased neuromuscular excitability [18].

The influence of adjunct analgesic medications such Research on NSAIDs, opioids, and diclofenac is ongoing but early findings suggest these agents may offer protective effects [7,16,21].

5.5 Summary

Post-suxamethonium myalgia remains a prevalent and sometimes unnappreciated complication in anesthesia. Ethiopian studies echo the global pattern of variable incidence and severity, while also highlighting a clear need for localized preventive strategies.



5.6 Conceptual framework

6. **Methodology**

6.1 Study Design

A cross sectional study design was employed to assess the incidence, severity, and associated factors of post-suxamethonium myalgia (PSM) among adult patients undergoing surgery at Tikur Anbessa Specialized Hospital (TASH), Addis Ababa, Ethiopia. Patients were followed postoperatively for 24 hours after the administration of suxamethonium during anesthesia induction.

6.2 Study Setting

The study was conducted at Tikur Anbessa Specialized Hospital (TASH), the largest tertiary-level specialized and teaching hospital in Ethiopia, located in Addis Ababa. The hospital offers a wide range of surgical procedures and has dedicated operating theaters, post-anesthesia care units, and recovery wards, making it an ideal setting for this study.

6.3 Population

6.3.1 **Source Population**

All adult patients undergoing surgery under general anesthesia at TASH during the study period.(Dec 2024-Mar 2025)

6.3.2 **Study Population**

Adult patients aged 18–65 yrs who undergo surgery under GA receiving suxamethonium chloride.

6.4 Inclusion and Exclusion Criteria

Inclusion Criteria:

- Age between 18 and 65 years

- Surgical procedures requiring tracheal intubation

- Use of suxamethonium chloride

- Provided written informed consent

Exclusion Criteria:

- Known/suspected malignant hyperthermia

- Pre-existing neuromuscular disorders

- Chronic pain medication use within the last 4 weeks

- Cognitive impairment affecting pain assessment

6.5 Sample Size Determination and Sampling Method

6.5.1 **Sample Size Determination**

Using the single population proportion formula(Z2P(1-P)/d2) with a 50% estimated prevalence of PSM, 95% confidence level, and 5% margin of error, the initial sample size was calculated as 384. With a source population (N) of 200 over the data collection period, finite population correction($nf = n/1+n/N$) yielded a final adjusted sample size of 131, which was increased by 10% to account for non-response, resulting in a final sample size of 144 participants.

6.5.2 **Sampling Method**

A convenience sampling technique was used. Eligible patients were identified and recruited preoperatively after informed consent.

6.6 Study Variables

Dependent Variable:

- Incidence and severity of post-suxamethonium myalgia (PSM)

Independent Variables:

- Demographic: Age, sex, BMI

- Clinical: Pre-existing pain conditions,

- Anesthetic factors: Dose and number of suxamethonium administrations, premedication, induction agents

6.7 Data Sources and Data Collection Tools

Data were collected through:

- Preoperative interviews using a structured questionnaire to capture demographics, medical history, and analgesic use

- Review of medical records for anesthetic and surgical details

- Postoperative assessment using a Numeric Pain Scale (NPS) for pain severity at 6, 12, and 24 hours post-surgery

- Muscle pain questionnaires assessing location, onset, and need for additional analgesia

6.8 Data Quality Assurance

- Data were checked daily for completeness and consistency

- Range and logic checks were performed during data entry

6.9 Data Processing and Analysis

Data were entered into a secure database and analyzed using SPSS version 26.

- Descriptive statistics summarized demographic, clinical, and anesthetic variables

- Incidence of PSM was reported as the proportion of patients with NPS(0-10)

- Severity trends were assessed using repeated measures

- Univariate and multivariate logistic regression identified predictors of PSM incidence and severity, with statistical significance set at $p < 0.05$

6.10 Ethical Considerations

Ethical clearance was obtained from the department of anesthesiology of Tikur Anbessa Specialized Hospital. Written informed consent was obtained from each participant. Confidentiality and data security were ensured through de-identification and restricted access to data. Participation was voluntary, and patients could withdraw at any time without affecting their care.

7. Results

7.1Socio-demographic and Clinical Characteristics

A total of 144 adult surgical patients were included. The mean (±SD) age was 45.9 ± 11.13 years (range: 18–65). Most participants were between 26–45 years (48.6%), and an equal proportion (48.6%) were ≥46 years. The majority (71.5%) had a normal BMI, while 15.6% were underweight.39.6% were female and 60.4% were male patients.

The most common surgical types were gastrointestinal (51.3%) and cardiothoracic (25.6%). Surgery duration exceeded 90 minutes for most patients (92.3%). Most were ASA class II (83.3%), and none reported pre-existing chronic pain.

7.2 Anesthetic and Procedure-related Factors

Propofol was the most frequently used induction agent (83.3%), followed by ketofol (8.3%) and ketamine (7.6%). All of the participants received one dose of suxamethonium.

7.3 Incidence of Post-Suxamethonium Myalgia

The overall incidence of Post-Suxamethonium Myalgia (PSM) was 42.36%.

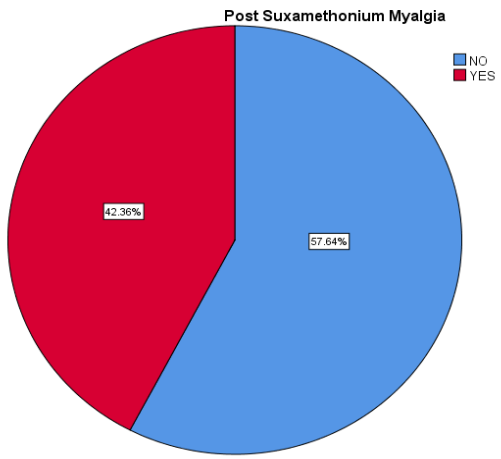


fig1.Incidence of PSM

7.4 Severity and Onset of PSM

- 23.8% experienced moderate myalgia
- 18.75% reported mild myalgia
- The onset of pain occurred within 6–12 hours in 34.7% of participants
- Pain duration was 1–2 days in 30.8% and less than 24 hrs in 11.8%

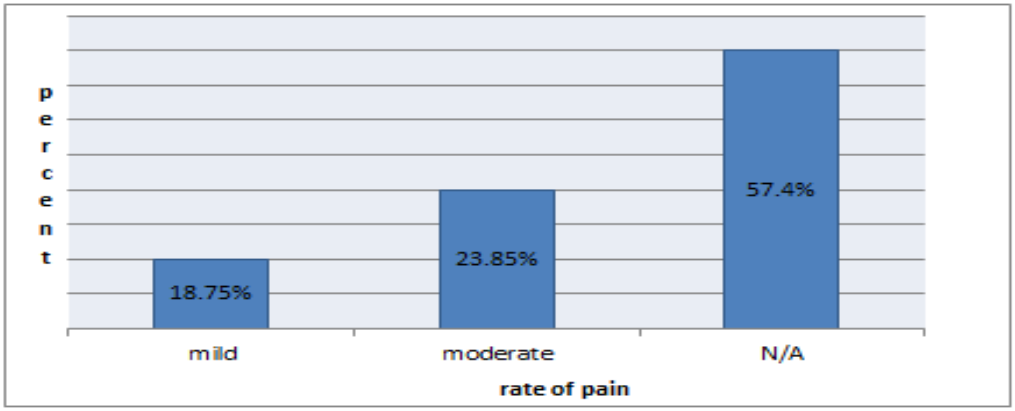


Fig 2. Incidence of PSM

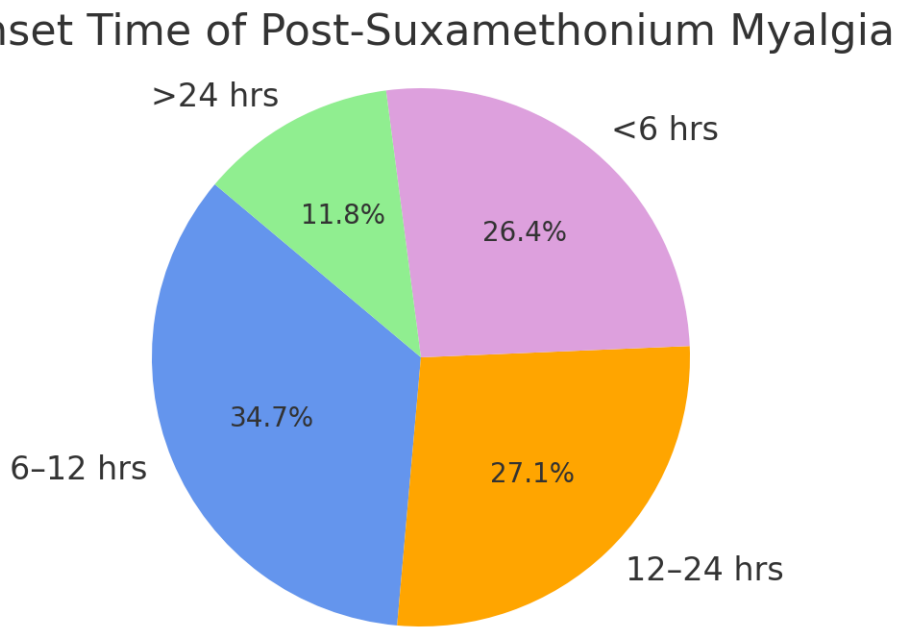


Fig 3. Onset time distribution of PSM

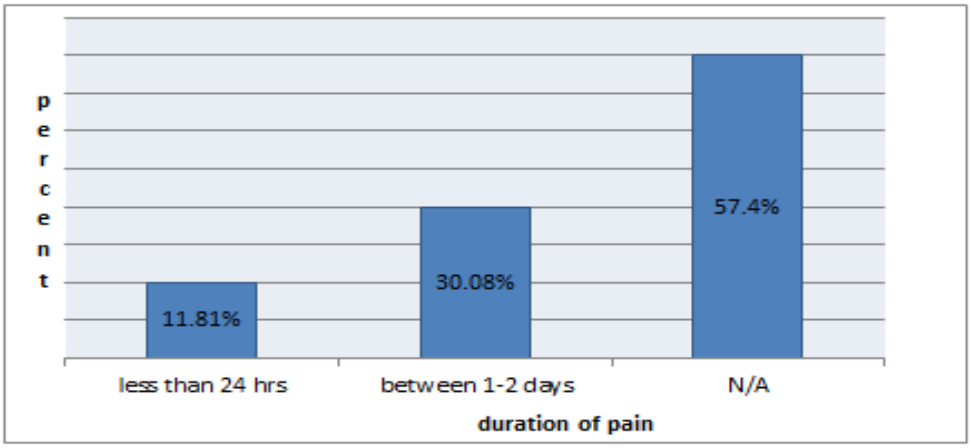


fig 4. Onset time distribution of PSM

7.5 Factors Associated with PSM

Multivariate logistic regression analysis showed two independent predictors:

1. BMI (Underweight): AOR = 4.7; 95% CI: 2.62–11.27; p = 0.01

2. Induction Agent (Ketamine): AOR = 2.4; 95% CI: 2.07–8.2; p = 0.05

Variables		PSM		COR	AOR	P value
		Yes	No	(95% CI)	(95%CI)	
Age	<=45	43	31	6.24(2.37-11.87)	3.4(1.9-9.84)	0.29
	>46	18	52	1	1	
BMI	Underweight	19	5	7(2.74-12.29)	4.7(2.62-11.27)	0.01
	Normal	36	67	0.98(0.26-2.7)	0.37(0.12-5.29)	0.73
	Overweight/Obese	6	11	1	1	
Analgesics	Not Used					
	Used	22	47	1	1	
Anesthetic drug used for induction	Ketamine	7	4	2.7(2.3-6.37)	2.4(2.07-8.2)	0.05
	Ketofol	6	6	1.55(1.2-9.29)	1.27(1.09-5.7)	0.82
	Propofol	47	73	1	1	0.01

8. Discussion

This study evaluated the incidence, severity, and associated factors of post-suxamethonium myalgia (PSM) among adult surgical patients at Tikur Anbessa Specialized Hospital. The result revealed overall incidence of PSM of 42.36%, with nearly quarter of patients(23.85%) of patients experiencing moderate pain and another 18.75% reporting mild pain.The majority of cases developed within 6-12 hrs postoperatively and resolves within two days.

The observed incidence aligns closely with findings from Debre Tabor hospital with reported incidence of 41.9%. However, this is higher than findings from Jimma Medical Center (29.3%) and Wolaita Sodo Teaching and Referral Hospital (36% at 12 hours postoperative). These variations may be attributed to differences in sample size, suxamethonium dosage, patient demographics, and type of surgery.

Among the various factors assessed,two emerged as statistically significant predictors of PSM.Being underweight and receiving ketamine for induction.Underweight patients were 4.7 times more likely to experience PSM than overweight and normal weight counterparts. This can be explained by reduced muscle mass, increased pain sensitivity, and lower nutritional reserves, all of which may heighten the severity of myalgia.

Patients induced with ketamine were 2.4 times more likely to develop PSM compared to those induced with propofol. This finding aligns with findings from Prospective Cohort Study among Adult Patients who underwent elective surgery at Jimma Medical Center [32]

These findings suggest that patient-related and anesthetic-related factors must be considered in reducing the burden of PSM.

Other vsriables such as age ,gender, premedication with NDNMBS, dose and frequency of suxamethonium administration and preexisting pain conditions were documented, analyzed and had no significant association.

9. Conclusion

This study demonstrated that Post-Suxamethonium Myalgia (PSM) is a prevalent complication among adult surgical patients at Tikur Anbessa Specialized Hospital, with an

overall incidence of 42.36%. Approximately 23.85% of patients experienced moderate pain, and 18.75% reported mild pain, typically beginning within 6 to 12 hours postoperatively and lasting 1 to 2 days.

Two key factors were significantly associated with an increased risk of PSM:
- Underweight BMI status, which increased the odds of developing PSM by 4.7 times.
- Use of ketamine for induction, which raised the likelihood of PSM by 2.4-times compared to propofol.

These findings underscore the importance of evaluating individual patient and anesthetic factors in minimizing the risk and impact of PSM.

9. Recommendations

9.1 For Clinical Practice

- Consider alternatives to suxamethonium: In non-emergency surgeries, the use of non-depolarizing neuromuscular blockers (e.g., rocuronium) should be considered.
- Prefer propofol over ketamine for induction: Propofol is recommended over ketamine in patients receiving suxamethonium.

- make use of defasciclulating dose of NDNMB
- Tailor suxamethonium dosing to body weight: Lower doses should be considered for underweight patients.
- Integrate regional anesthesia techniques: This may minimize the need for neuromuscular blockers.

9.2 For Anesthesia Providers

- Conduct preoperative risk assessment including BMI and anesthetic plan.
- Optimize postoperative monitoring and pain management in high-risk patients.

9.3 For future research

- Conduct interventional studies on pretreatment strategies (e.g., magnesium sulfate, lidocaine).
- Explore the effect of various induction agents on PSM in broader populations.
- Study suxamethonium dose adjustments based on body composition.

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Questionnare

Section 1: **Patient Information**

MRN:

1. Age:

2. Gender:

A. Male

B.Female

3. Body Mass Index (BMI):

A.Underweight (<18.5)

B.Normal (18.5-24.9)

C.Overweight (25-29.9)

D.Obese (>30)

4.ASA status

A.ASA I

B.ASA II

C.ASA III

D.ASA IV

Section 2: **Clinical Factors**

1. Type of Surgery

A.Gastrointestinal

B.Obstetric

C.ENT

D.Orthopedic

E.cardiothoracic

F.urologic

G.neurosurgical

E.Other

2. Duration of Surgery:

A.Less than 30 minutes

B.30-60 minutes

C.60-90 minutes

D.More than 90 minutes

3. Dosage of Suxamethonium Administered:

4.Number of Doses of Suxamethonium Administered:

A.1

B.2

C.More than 2

5.Was defasciculating dose of NDNMBs(e.g vecuronium) given

A.Yes

B.No

5.Anesthetic agent used for induction

A.ketamine

B.Propofol

C.Ketofol

D.Thiopental

6.Presence of chronic pain

A.Yes(please specify)

B.No

7.Preoperative analgesic usage

7.1.A.Yes

B. No

7.2 If yes,what is the duration?

A.< 4weeks

B.> 4 weeks

7.3 Type of analgesic(Check all that apply)

A.NSAIDS

B.Opiods

C.Paracetamol

D.Other(specify)

8. Postoperative analgesics(check all that apply)

A.Opioids

B.Paracetamol

C.NSAIDs

d.All

Section 3: **Myalgia-Specific Questions**

1. Did you have any pain or stiffness in your muscles other than the operation site?

   A.Yes

   B.No

2. If yes, when did the muscle pain start?

   A.Immediately after surgery

   B.Within 6-12 hours

   C.Within 12-24 hours

   D.After 24hours

3.Severity of Muscle Pain (on a scale of 1-10):

A.1-4 (Mild)

B.4-7 (Moderate)

C.7-10 (Severe)

4.Duration of Muscle Pain:

A.Less than 1 day

B.1-2 days

C.More than 2 days

5.Location of Muscle Pain (Check all that apply):

A.Neck

B.Shoulders

C.Back

D.Chest

E.Abdomen

F.Limbs

7. Did you require additional analgesics for the muscle pain?

A.Yes

B.No

8. If yes, which type of analgesics were used?

A.NSAIDs (e.g., ibuprofen)

B.Paracetamol

C.Opioids

D.Other (please specify): __