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Evaluation of the Muscles Pain Post General Anesthesia for Patients Who Inductions Succemethenium

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Abstract:

The aim is to Evaluation the Muscle Pain post general anesthesia for patients who induction succemethenium, Material, and Methods: The design of the study is descriptive, using a convenience sample of twenty diabetic patients (20) who were going to Operation Theater. Patients included in this study have the following criteria: 1. Be alert and be able to communicate verbally. 2. They are induction suxamethonium, Result: surgery, (27.8%) of patients went to the O.T. for cesarean section and cholecystectomy, respectively. Hysterectomy and laparotomy had the same percentage (11.1%). Just three patients went to the O.T. for an appendectomy. In relation to the duration of surgery, exactly one-half of the studied sample took two hours to finish the surgery, while just two patients consumed one hour, on the other hand, more than one-tenth of eighteen patients needed three hours to finish the surgery. Two-thirds (61.1%) of patients were administered ketamine as induction, and a majority (1889.9%) of patients were administered thiopental. While the majority (88.9%) of all the studied patients were administered the protocol. All patients were administered N2O and muscle relaxants as maintenance; one-half (50.0%) of patients were given ISO. of temperature; 72% of patients had a normal temperature at the first hour of surgery, and at the end of the second hour, the temperature was falling between 34 and 36 c. In the third hour, the percentage is still as in the second hour, Conclusion is that sincere efforts are required to find the efficacy of a technique that could significantly reduce the undesirable side effects of succinylcholine in order to curtail the valuable hospital costs being spent on the health of the patients in our poor country.

Keywords: Muscles, Anesthesia, Succemethenium, Surgery

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Introduction

On initial impression, suxamethonium contrasts sharply with drugs such as digitalis or quinine in having a short, and fairly straightforward history. In fact, its emergence as a therapeutically useful drug was surprisingly long and complex. Suxamethonium (also known as succinylcholine, succinyldicholine) is a neuromuscular blocking agent, commonly classed as a "depolarizing agent" (1). It blocks transmission of impulses from motor nerves to skeletal muscle by interacting with receptors on the post-junctional membrane.

These motor end-plate receptors normally combine with the transmitter molecule, acetylcholine, which is released from the nerve terminal on the arrival of an action potential. Acetylcholine is synthesized and stored in the nerve terminal. Its release results from nerve terminal depolarization, and depends on the entry of calcium ions (2). The transmitter molecules diffuse across the neuromuscular junction and interact with motor end-plate receptors

causing a depolarization of the end-plate, which is enough to initiate electrical changes leading to muscle contraction. Suxamethonium is structurally similar enough to acetylcholine to cause a membrane depolarization, and a muscle twitch, after which blockade sets in. Views of its mechanism of action have changed as the understanding of neuromuscular transmission has progressed (3). The history of neuromuscular blocking agents starts with curare,1 a substance which Koelle calls "a drug with a long and romantic history".2 Curare, a complex group of competitive neuromuscular blocking agents, has been used for centuries to kill wild animals by tribes in South America, Borneo, and other aboriginal cultures. It is prepared as a crude extract of one or more of a variety of plants (4). In eastern Amazonia, the principal sources are various species of Strychnos, while the natives of western Amazonia use Chondrodendron species. When a dart coated with curare hits an animal, its skin is penetrated, the drug enters the circulation, and death due to paralysis of the respiratory muscles promptly ensues. The advantage of curare is that it is poorly absorbed through the gut wall of persons eating meat killed in this way – it is thus a very specific poison (5). Curare was known to western medicine in the nineteenth century. McIntyre,3 surveying its clinical history, pointed out that its use in the treatment of tetanus was first suggested by Sir Benjamin Collins Brodie (1783-1862)4 in a letter to Pierre Flourens in 1811, also reporting his recent demonstration that curarized animals could be resuscitated with artificial respiration.5 In 1858, Lewis Albert Sayre (1820-1900) first used curare in human tetanus - unfortunately the patient, an Irish labourer in New York, died.6 Over the next forty years, the use of curare in tetanus became widespread, and epilepsy, hydrophobia, and chorea were similarly treated (6). Claude Bernard (1813-1878) described the drug's neuromuscular blocking action in 1856, 7 having worked with it since 1844.1 Modern clinical use of curare began in 1932, when Ranyard West9 employed curare-based preparations in the treatment of tetanus and spastic disorders. However, it was the introduction of electric shock therapy (ECT) for the treatment of depressive illness that was to provide the main impetus for curare's widespread use. Indeed, the entire ECT technique would have been abandoned had not an American psychiatrist, Abram Elting Bennett (b. 1898), advanced the idea of using curare to block neuromuscular transmission, thus preventing the disturbing occurrence of fractures and dislocations due to massive contraction of skeletal muscles during treatment (7).

Material and methods

Materials

Study design

The research design of this study is descriptive.

Setting

This study was carried out in **Operation Theater of Al-Wahda Hospital/ Derna**.

Subjects

The study subjects were a convenience sample of twenty diabetic patients (20) they were went to Operation Theater.

Patients were included in this study have the following criteria:

1. Alert, and be able to communicate verbally.
2. They are induction suxamethonium

Method

1. An official letter from the Dean of the College of Medical Technology was addressed to the director of the Al-Wahda Hospital to permission to carry out the study to take their approval conducting of the study after the explanation the purpose of the study.
2. The study sample based on questioner data (appendix I):
    a. The researchers were evaluating the pain 24 post-operative.
    b. The measuring was done by visual analogue post 24 hours of anesthesia to evaluate the degree of myalgia.
3. Data collection was conducted between May and October 2019.

Table (I): Sociodemographic characteristics of studied patients

It is shown that (22.2 %) of patients were between 20 – 29 years old. Two-third (61.1%) of patients were between30-39 years old. One-fifth (5.6%) of patients were between 40-49 years old. While one- tenth (11.1%) of patients were between 50 – 59 years old. Concerning sex, (16.7%) of patients were males, and the majority (83.3%) were females. The results also revealed that two- third of patient (66.7%) of patients were married. Less than one quarter (22.2%) of patients were single. Regarding level of education, (16.7%) of patients were had primary level. (11.1%) of patients had preparatory level. Less than one-half (44.4%) of patients had university level of education. In relation to occupation, (16.7%) of patients' profession was hand craft. More than one-half (55.6%) of patients were housewives. Regarding Residence, the majority (88.9%) of patients were lived in urban, vice versa approximately one-tenth (11.1%) of patient they were came from rural

Table (I): Sociodemographic characteristics of studied patients

Sociodemographic characteristics		N=18	%
Age	20<30	4	22.2
	30<40	11	61.1
	40<50	1	5.6
	50<60	2	11.1
Sex	Male	3	16.7
	Female	15	83.3
Marital status	Single	4	22.2
	Married	12	66.7
	Divorced	1	5.6
	Widow		
Level of education	Primary	1	5.6
	Preparatory	3	16.7
	Secondary	2	11.1
	University	5	27.8
		8	44.4
Occupation	Housewife	10	55.6
	Clerical	3	16.7
	Students	2	11.1
	Other	2	11.1
Residence	Urban	16	88.9
	Rural	2	11.1

Table (II): Distribution of studied patients in relation to clinical data

Regarding types of surgery, (27.8%) of patients were went to O.T for cesarean section and cholecystectomy respectively. Hysterectomy and laparotomy were had the same percentage (11.1%). Just three patients were went to O.T for appendectomy. In relation to duration of surgery, exactly one half of the studied sample taken two hours to finishing the surgery, while just two patients consumed one hour, on the other hand more than one-tenth of eighteen patients were needed three hours to finishing the surgery.

Table (II): Distribution of studied patients in relation to clinical data

Clinical data		N= 18	%
Types of surgery	Cesarean Section	5	27.8
	Cholecystectomy	5	27.8
	Appendectomy	3	16.7
	Hysterectomy	2	11.1
	Laparotomy	2	11.1
	Got Shot	1	5.6
Duration of Surgery	45 mins	4	22.2
	1 hour	2	11.1
	2 hours	9	50.0
	3 hours	3	16.7

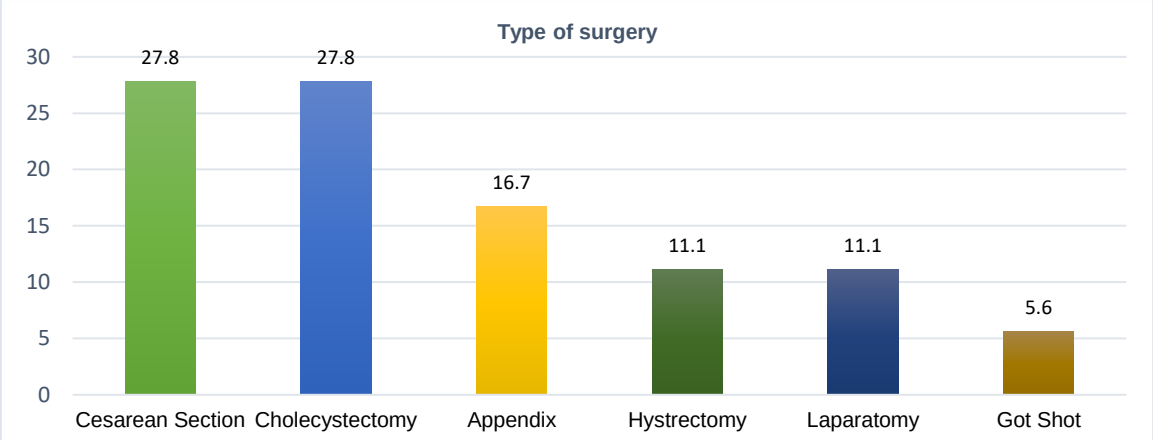

Figure 1: distribution of studied patients in relation to types of surgery

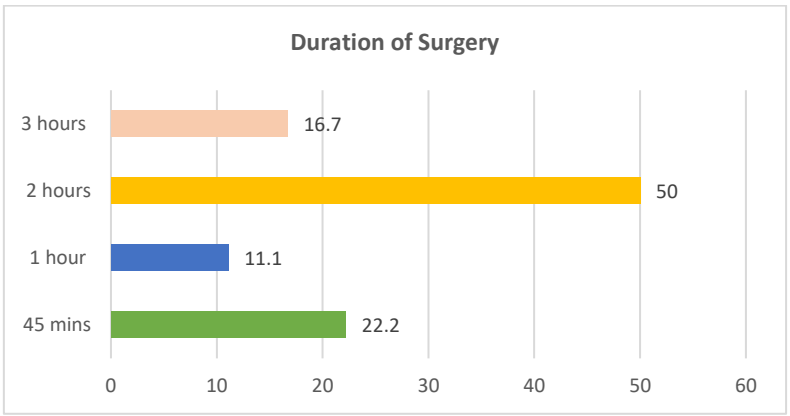

Figure 2: distribution of studied patients in relation to duration of surgery

Table (III): Distribution of studied patients in relation to anesthetic agents' induction and analgesia
It was found that, two-third (61.1%) of patients were administered ketamine as induction, majority (188.9%) of patient were administer thiopental. While the majority (88.9%) of all the studied patients were administer propofol. In relation to **analgesia,** we noted that; the majority of patient were administer tramadol as analgesia, while just two patients were administer fentanyle as analgesia.

Table (III): Distribution of studied patients in relation to anesthetic agents' induction and analgesia

Induction and Analgesia	N		%
Ketamine	Yes No	7 11	38.9 61.1
Thiopental	Yes No	2 16	11.1 88.9
Protocol Tramadol	Yes No Yes No	16 2 15 3	88.9 11.1 83.3 16.7
Fentanyle	Yes No	2 16	11.1 88.9

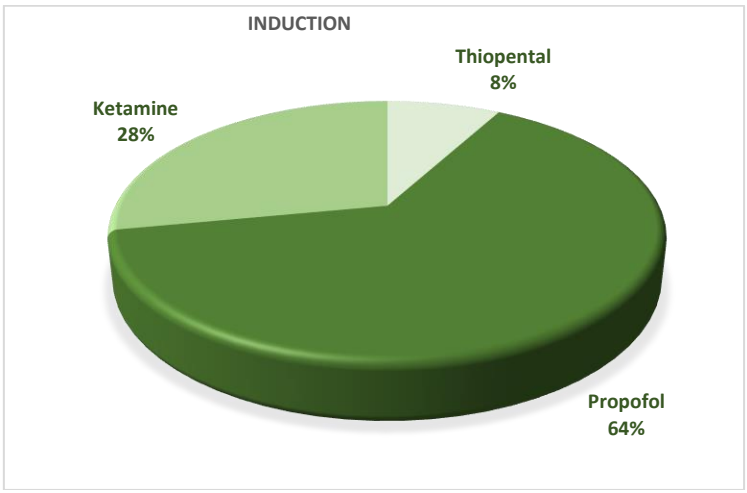

Figure 3: distribution of studied patients in relation to induction of anesthesia

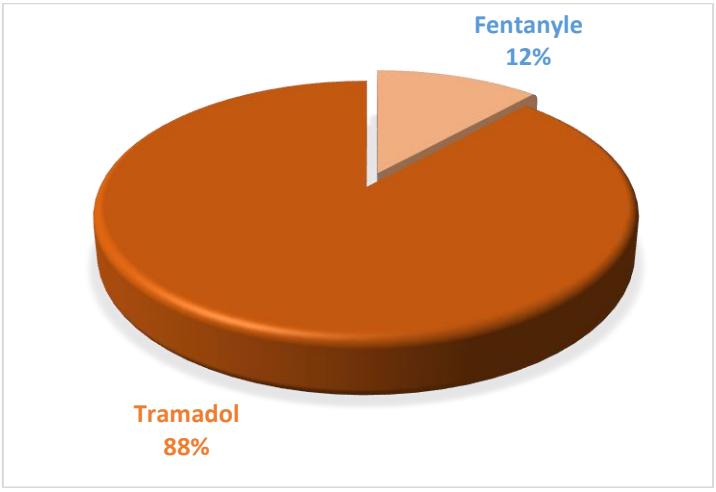

Figure 4: distribution of studied patients in relation to types of analgesia

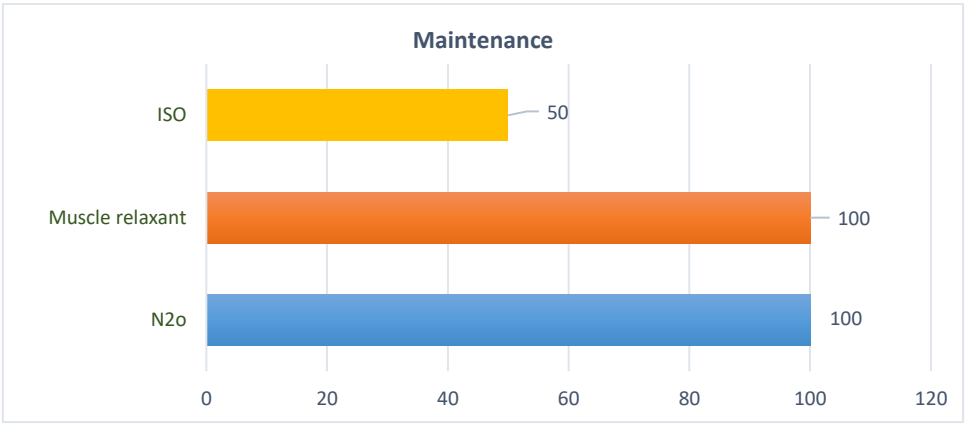

Figure 5: distribution of studied patients in relation to maintenance agents

Table (IV): Distribution of studied patients in relation to anesthetic maintenance
It was found that, All patients were administered N2O and muscle relaxant as maintenance, one half (50.0%) of patient were give them ISO.

Table (IV): Distribution of studied patients in relation to anesthetic maintenance

Maintenance		N=18	%
N2o	Yes No	18 0	100 0
ISO	Yes No	9 9	350.0 50.0
Muscle relaxant	Yes No	18 0	100 0

Table (V): Distribution of studied patients in relation to temperature measuring.
In relation to initial measuring of temperature, 72% of patients were had normal temperature, as same as at the first hour of surgery, while at the end of second hour the temperature were falling between 34c and 36c. At the third hour the percentage still as in second hour.

Table (V): Distribution of studied patients in relation to temperature measuring.

Temperature measuring		N	%
Initial Assessment	37-38 <38-39	13 5	72.2 27.8
1st hour	37-38 <38-39	13 5	72.2 27.8
2nd hour	34-36 36.50- 38.50	9 7	56.3 43.8
3rd hour	34-36 36.50- 38.50	5 4	55.6 44.4
Recovery Time	>5 <5	9 9	50 50

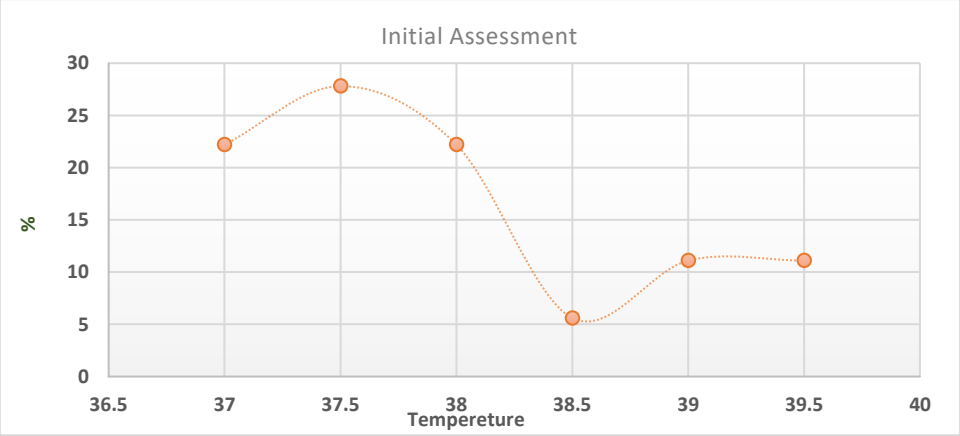

Figure 6: distribution of studied patients in relation to temperature's initial assessment

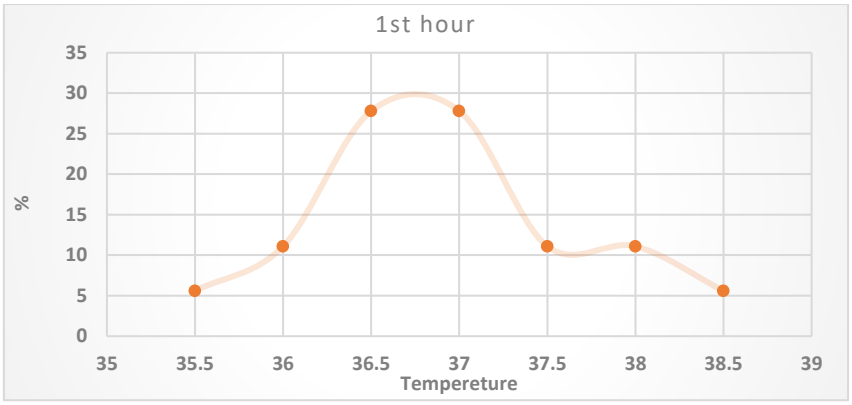

Figure 7: distribution of studied patients in relation to temperature's 1st hour

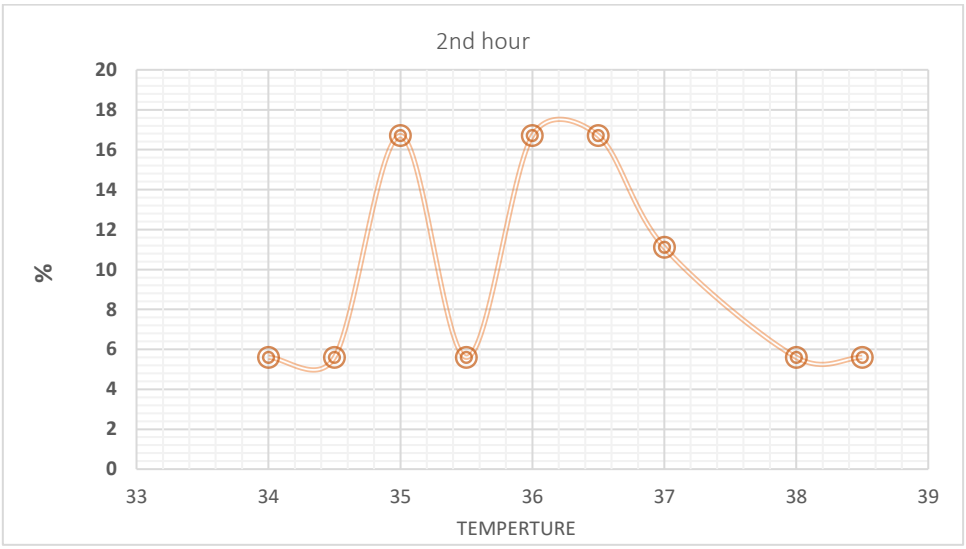

Figure 8: distribution of studied patients in relation to temperature's 2nd hour

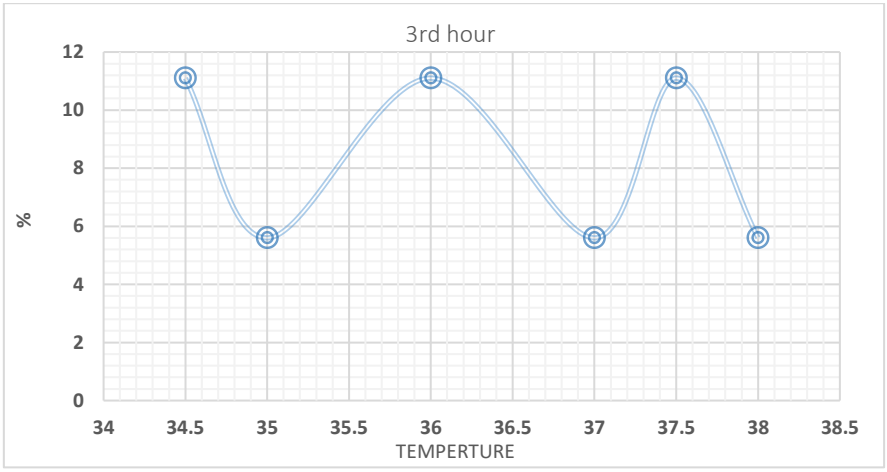

Figure 9: distribution of studied patients in relation to temperature's 3rd hour

Succinylcholine is a popular drug due to the fact that it rapidly provides the ideal conditions for short procedures requiring endotracheal intubation (Abbas et al., 2009). Nevertheless, it is associated with muscular injury as it depolarizes the muscles prior to paralysis (Fukani and Ganzberg, 2004). This muscular injury is manifested in the form of fasciculations and postoperative myalgia.

These muscular unwanted effects of succinylcholine have limited its usefulness and present distressing consequences for the patients after minor surgeries (Spence et al., 2002). In our study, the frequency of myalgia was (65%), the intensity of myalgia ranged from mild to moderate. Schrieber et al did a meta-analysis of randomized trial on prevention of succinylcholine-induced fasciculations and myalgia and found that the best prevention of myalgia was with non-steroidal anti-inflammatory drugs and with r comparing the efficacy of rocuronium and vecuronium for intubation, succinylcholine induced myalgia and the levels of creatine phosphokinase and urine myoglobin after the pretreatment with rocuronium.

In an attempt to correlate succinylcholine-induced fasciculation with muscle injury and the ensuing muscular pain and stiffness, changes in serum creatine phosphokinase after succinylcholine administration were studied. However, there was no correlation between muscle pain and creatine phosphokinase elevation [27].

Further studies showed no obvious relationship between pain and biochemical changes [28, 29]. Another theory is that postoperative myalgia is due to the release of large amounts of lactic acid in the muscle [30]. There is insufficient evidence to substantiate this view.

Many studies have been performed in order to identify the ideal method of decreasing the incidence of postoperative myalgia. The different methods and their proposed mechanisms of action are discussed below.

Conclusion

In conclusion, it is suggested that sincere efforts are required to find the efficacy of a technique which could significantly reduce the undesirable side effects of succinylcholine in order to curtail the valuable hospital cost being spent on the health of the patients in our poor country.

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