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ROCURONIUM VERSUS ATRACURIUM FOR DAY-CASE SURGERY

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بسم الله الرحمن الرحيم

قالوا سبحانك

لا علم لنا إلا ما علمتنا

إنك أنت العليم الحكيم

صدق الله العظيم

آيه ٣٢ سورة البقرة

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DAY-CASE SURGERY

The terms "day-case surgery", "ambulatory surgery" and "out-patient surgery" are used to indicate that the patient is discharged on the day of surgery without overnight hospital stay[1].

Recent advances in anesthetic and surgical techniques, along with increasing healthcare costs, have resulted in an ever-increasing number of surgical procedures being performed on a day-case basis world-wide. The cost-effectiveness of day-case surgery is well recognized[1].

Day-case surgery constituted 60-70% of all surgery performed in North America in the 1990's[2], but in other parts of the world the numbers are lower. However, as outcome data become available confirming the safety of day-case surgery, it is anticipated that even more procedures will be performed on a day-case basis[1].

Recent surgical advances include the use of endoscopic approaches for procedures such as gastroscopy, colonoscopy, bronchoscopy and laparoscopic gynecological procedures. Major day-case surgerical procedures (e.g. Knee and shoulder reconstructions, laparoscopic-assisted vaginal hysterectomies, gastric fundoplications) are being performed at many centers. Even pulmonary lobectomy, prostatectomy, carotid

endarterectomy and minor craniectomy procedures are being performed on a same-day basis[3].

With the major advances in anesthetic techniques along with the use of anesthetic agents of short duration, it is expected that the number, diversity and complexity of operations performed in outpatient setting will continue to increase[1].

Most day-case surgerical procedures are associated with relatively minor surgical trauma. So discharge of these patients frequently depends on recovery from anesthesia. Top priorities for successful outpatient surgery are the four "A"s: alertness, ambulation, analgesia and alimentation. Excessive fatigue, nausea, vomiting or unrelieved pain will delay discharge; these symptoms are the most common reasons for unanticipated hospital admission. Since the proportion of surgery done on an out-patient basis is increasing and since early discharge and patient satisfaction are important goals, pain management is receiving great attention. Rapid recovery after the use of new, short-acting anesthetic agents has led to the concept of fast-tracking and bypassing the post-anesthetic care unit (PACU)[4].

Safety, rapid recovery and minimal postoperative problems are essential in selecting surgical procedures and anesthetic techniques for day-case surgery. The choice of anesthetic technique can affect postoperative morbidity at home[5]. Several new drugs have significant advantages in terms of rapid onset,

excellent analgesia and amnesia, good surgical conditions and early recovery[1].

In order to facilitate an efficient turnover of cases, while ensuring patient fitness for discharge, the anesthetic used must be carfully selected. This includes the choice of muscle relaxants. Many anesthetists avoid the use of suxamethonium in day-case patients, leaving the choice from among the available non-depolarizing agents such as atracurium and rocuronium. The agent chosen should ideally facilitate early intubation, maintain an acceptably brief duration of action and permit easy reversal of paralysis at the end of surgery[6].

Day-case surgery has presented a new set of challenges and goals for anesthetists. Therefore advances in day-case anesthesia and development of minimally invasive surgical techniques will be expected to continue[1].

MUSCLE RELAXANTS
HISTORICAL REVIEW

The arrow poison, used for hunting by native peoples of south America, has been known for centuries. Many spectacular personalities reporting the poison, among them was sir Walther Raleigh (1552-1618). He described the poison in 1596, and it was named "curari". For many years, this poison was the basis for experiments in different parts of Europe, Some of the famous results were the finding of Benjamine Brodie[7,8] and his assistant, they showed that the poison paralysed the respiratory muscles, and an animal given curare could be kept alive if ventilated.

Despite these experiments, muscle relaxants were not used in routine clinical practice until over 100 years later when safe techniques of artificial ventilation and standardized preparation of curare become available[7,8]. In 1942, Griffith and Johnson[9] suggested that d-tubocurarine is a safe drug to use during surgery.

The first synthetic muscle relaxant, succinylcholine, introduced by Foldes et al.[10], in 1952, revolutionized practice by providing intense blockade of short duration, thereby the maneuver of tracheal intubation become easier.

The synthetic and semisynthetic non-depolarizing drugs, gallamine, dimethyltubocurarine and alcuronium, introduced over the next decade, were alternatives to d-tubocurarine[11].

In 1967, Baird and Reid[12] reported the clinical administration of the synthetic aminosteroid pancuronium.

In the early 1980's, the nearly simultaneous introduction of the two muscle relaxants of intermediate duration, atracurium and vecuronium further revolutionized clinical practice by providing relaxation with little dependence on the kidneys for elimination, encouraging tracheal intubation with non-depolarizing drugs and improving postoperative neuromuscular function resulting in a shorter period of risk of weakness in post anesthetic care unit[13,14].

The early1990's witnessed the introduction of two long acting muscle relaxants found to be free of side effects pepicuronium and doxacurium[15].

An atracurium isomer, cisatracurium, introduced in 1996, that was found to be approximately three times more potent than atracurium, with no histamine release and is devoid of cardiovascular side effects, it retains the intermediate duration of action of atracurium and eliminated by Hofmann degradation which may have a greater role in its elimination than in elimination of atracurium[16].

A short-acting relaxant hydrolyzed by plasma cholinestrase (mivacurium) and an intermediate duration substance with rapid onset (rocuronium) were also added to the list[17].