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### RESEARCH ARTICLE

#### COMPLICATIONS OF SPINAL ANESTHESIA FOR SCHEDULED SURGERY EXPERIENCE OF THE MILITARY HOSPITAL MOULAY ISMAIL MEKNES

Diai Abdellatif<sup>1,2</sup>, Ilias El M'rabet<sup>1,2</sup>, Maaroufi Ayoub<sup>1,2</sup>, Jebbar Nourddine<sup>1,2</sup>, Elkaissi Jaber<sup>1,3</sup>, Laoutid Jaouad<sup>1,2</sup> and Hicham Kechna<sup>1,2</sup>

1. Anesthesiology & Intensive Care Department, Moulay Ismail Military Hospital, Meknes, Morocco.
2. Faculty of Medicine, Sidi Mohamed Ben Abdellah University, Fes, Morocco.

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#### Abstract

Spinal anesthesia is a widely practiced technique in anesthesia, it has advantages compared to general anesthesia. It requires little equipment and anesthetic drugs and is therefore inexpensive. Spinal anesthesia, like any medical act, is associated with certain accidents, and its complications, although rare, are becoming more and more a concern for anesthesia specialists. Our work focuses on the practice of spinal anesthesia in the operating room of the Moulay Ismail Military Hospital of Meknes (HMMIM) and especially on the morbidity and mortality due to this type of anesthesia. In addition, the objectives of our work are:

- To report the incidence of this anesthetic practice.
- To study the incidents and or intraoperative complications of spinal anesthesia (Morbi-mortality).
- To compare our results with the data in the literature.

The 5010 patients who underwent scheduled surgery under spinal anesthesia with an age ranging from 14 to 70 with a predominance of male 3557 cases or 71% against 1451 female cases or 29% (sex ratio 2.45). In our study series 38.90% had arterial hypertension in their history, 32.4% were diabetic, 13.20% had liver disease, 7.3% had renal failure, 5.5% had thromboembolic disease, 1.75% had psychiatric disorders, 1.40% were followed in oncology. 3206 cases were classified ASA I or 64%, 1102 cases ASA II or 22% and 701 cases ASA III or 14%. The puncture was performed in the sitting position in 3714 cases (74.14%) and in the lateral decubitus position in 1296 cases (25.85%). In our series 468 patients presented intraoperative complications including arterial hypotension, bradycardia, nausea and vomiting, failure and conversion to general anesthesia, impossible approach and cardio respiratory arrest. While the complications and risks are extremely rare, given their seriousness, prevention requires mastery of the technique, respect for simple safety measures, knowledge of the pharmacology of the products used, detection of prodromal signs announcing serious complications and rapid management of these manifestations. Rigor in the choice of the technique according to the clinic but also to the terrain must be the rule.

**Corresponding Author:- Diai Abdellatif**

Address:- Anesthesiology & Intensive Care Department, Moulay Ismail Military Hospital, Meknes, Morocco.

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**Introduction:-**

Spinal anesthesia is a widely practiced technique in anesthesia, it consists in interrupting the nerve conduction in a territory of the body in a specific temporary and reversible way [1]. According to the INSERM study [2], it can be calculated that almost 600,000 spinal anesthesia are performed in France per year, i.e. more than 1 per minute throughout the year.

Spinal anesthesia (RA) has advantages compared to general anesthesia. It requires little equipment and anesthetic drugs and is therefore inexpensive. The set-up time is short, and the failure rate is low compared to other techniques of locoregional anesthesia. Finally, it allows the patient's consciousness to be preserved but it is not without risks. [3]

Spinal anesthesia, like any medical act, is associated with certain accidents, and its complications, although rare, are becoming more and more a concern for anesthesia specialists. It generates 3 times more claims than general anesthesia in proportion to the number of procedures. [4]

Our work focuses on the practice of spinal anesthesia in the operating room of the Moulay Ismail Military Hospital of Meknes (HMMIM) and especially on the morbidity and mortality due to this type of anesthesia. In addition, the objectives of our work are:

- To report the incidence of this anesthetic practice.
- To study the incidents and or intraoperative complications of

Rach anesthesia (Morbi-mortality).

- To compare our results with the data in the literature.

**Patients and Methods:-**

Our study was conducted in the operating room of the Moulay Ismail Military Hospital in Meknes, over a period of 5 years from September 2015 to September 2020, concerning the following surgical departments: traumatology, urology, visceral, vascular, gynecology-obstetrics and plastic surgery.

Included in our study were all patients aged 15 to 70 years who had undergone spinal anesthesia as part of a scheduled surgery with acceptance of the technique and no contraindication.

All patients had a preanesthetic consultation with classification of the patients according to ASA.

On admission to the operating room, all patients received standard monitoring with measurement of blood pressure, pulsed oxygen saturation with respiratory rate and electrocardiogram.

The spinal anesthesia protocol used in the anesthesiology department of the Moulay Ismail Military Hospital of Meknes (HMMI) is standardized as follows:

- Three blood pressure measurements with a pre-fill by 10 ML/kg of crystalloids.
- Asepsis measure in rigor.
- Location of the ridge line.
- The local anaesthetic used is 0.5% hyperbaric Bupivacaine.
- Dose of local anesthetic =10 to 15mg.
- Adjuvant morphine: Fentanyl at a fixed dose of 25 micrograms
- The spinal needle used in our function is a pencil point needle (25 Gauge).
- Return to the supine position.
- Quality of the block evaluated by the test of absence of thermal sensitivity and meeting the level required for each surgery.
- Monitoring every minute of the patient's vital parameters until the block is installed, then every 5 minutes.

The incidents of spinal anesthesia collected in our study can be classified in 3 categories according to the degree of gravity "table A."

Severity of the incidents	The complications
Minor	-Nausea and vomiting. Moderate arterial hypotension (a drop of at least 30%). -Several attempts at spinal anesthesia.
moderate	-Severe arterial hypotension (a drop of more than 30%). - Bradycardia (vagal shock). -Failure and conversion to general anesthesia. - Impossible approach
severe	- Cardiopulmonary arrest ;

### Results:-

The 5010 patients who underwent scheduled surgery under spinal anesthesia with an age ranging from 14 to 70 with a predominance of male 3557 cases or 71% against 1451 female cases or 29% (sex ratio 2.45).

In our study series 38.90% had arterial hypertension in their history, 32.4% were diabetic, 13.20% had liver disease, 7.3% had renal failure, 5.5% had thromboembolic disease, 1.75% had psychiatric disorders, 1.40% were followed in oncology. 3206 cases were classified ASA I or 64%, 1102 cases ASA II or 22% and 701 cases ASA III or 14%.

The distribution of patients according to the type of surgery is presented in the table below:

Type of surgery	Number (N=5010)	Frequency (%)
Trauma and orthopedicsurgery	n=2555	50,9 %
Fracture of the leg tibia and fibula	869	34,02 %
Fracture of the femur	537	21,01%
Ligament/tendon injury	383	14,99%
Arthroscopy	357	13,97%
Trochanteric fracture	255	9,98%
Arthritis	154	6,03%
Urological surgery	n=1311	26,16%
Prostatic pathology	409	31,19%
JJ probe lift	275	20,97%
Cystoscopy	249	18,99%
RTUV	196	14,95%
Testicular ectopy	80	6,13% %
Varicocele	72	5,49%
Hydrocele	30	2,28%
Visceral surgery	n=776	15,48%
inguinoscrotal hernia	430	55,41%
Umbilical hernia	306	39,43%

The puncture was performed in the sitting position in 3714 cases (74.14%) and in the lateral decubitus position in 1296 cases (25.85%).

In our series 468 patients presented intraoperative complications including arterial hypotension, bradycardia, nausea and vomiting, failure and conversion to general anesthesia, impossible approach and cardio respiratory arrest.

Intraoperative complications	Number (N=468)	Frequency
Moderate arterial hypotension	221	47,22%
Severe hypotension	97	20,72%
Bradycardia	51	10,89%
Several attempts	47	10,04%
Nausea and vomiting	37	7,90%
Failure and conversion to GA	13	2,77%

Impossible access	1	0,21%
Cardiorespiratory arrest	1	0,21%

**Operating Sheets :**

Date of operation	
AGE	
Sex	
Background	<input type="checkbox"/> Medical ..... <input type="checkbox"/> Surgical: ..... <input type="checkbox"/> Toxics: ..... <input type="checkbox"/> NIL
ASA classification	<input type="checkbox"/> ASA I <input type="checkbox"/> ASA II <input type="checkbox"/> ASA III
Type of surgery and reason	<input type="checkbox"/> Trauma and Orthopedic Surgery ..... <input type="checkbox"/> Urological surgery..... <input type="checkbox"/> Visceral surgery..... <input type="checkbox"/> Gynecology-obstetrical surgery..... <input type="checkbox"/> Vascular Surgery..... <input type="checkbox"/> Plastic surgery.....
Position used for spinal anesthesia	<input type="checkbox"/> Lateral decubitus <input type="checkbox"/> Semi-sitting position
The anesthetics used	Bupivacaine 0.5% hyperbaric 10-20 mg and Fentanyl 25-50 µg (adjuvant) ..... Other:
The incidents	<input type="checkbox"/> Moderate arterial hypotension <input type="checkbox"/> Severe arterial hypotension <input type="checkbox"/> Bradycardia <input type="checkbox"/> Nausea and vomiting <input type="checkbox"/> Failure and conversion to GA <input type="checkbox"/> Impossible access <input type="checkbox"/> Cardiorespiratory arrest
Efficiency of the block	<input type="checkbox"/> Success <input type="checkbox"/> Failure and conversion to GA

**Discussion:-**

In our series, the frequency of spinal anesthesia is 22%, within the range reported by Carpentier JP et al [5]. A national survey by the French Society of Anesthesia and Intensive Care (SFAR) in 1996 found a frequency of 5.6% in France [6]. The frequency of spinal anesthesia is higher in developing countries than in developed countries and higher in poorly equipped hospitals than in well-equipped hospitals [5,6]: arterial hypertension in 38.90%, diabetic in 32.4% , had hepatopathy in 13.20% , renal failure in 7.3%, thromboembolic disease in 5.5%, psychiatric disorders in 1.75% and 1.40% were followed in oncology , Patients classified ASA I were in the majority of 64%.

The incidents reported in our series are dominated by hypotension, which is the most frequent 67, 94% (47.22 moderate) (20.72% severe) it is also the most frequent complication of spinal anesthesia reported by other studies [7-8].

Prevention of arterial hypotension uses means such as filling, vasopressors such as ephedrine, phenylephrine and metaraminol [7,9,10,11]. Vascular filling and administration of ephedrine in our practice was used for prophylaxis. Prefilling is currently discussed. Rout CC et al [9] demonstrated that prefilling reduces the incidence of arterial hypotension in a non-significant way. Ewaldsson CA et al have shown that cofilling is more effective on arterial hypotension [12]. In relation to the type of solute, colloids are more effective than crystalloids [13-14]. The

combination of phenylephrine with ephedrine with a ratio of 15-50 µg/3mg has better efficacy, reducing the incidence of arterial hypotension from 75% with ephedrine alone to 37% [14].

Arterial hypotension is responsible for nausea, vomiting, hypoxia, disturbances of consciousness and even serious accidents such as ischemic strokes and cardiac arrest. In our study, the frequency of nausea and vomiting (7.90%) is lower than those reported by Aragão FF de et al [9], Moslemi F et al [10] and Bennisr L et al [15] which are respectively 31%, 22% and 30%.

The incidence of bradycardia after spinal anesthesia or APD varies between 9 and 30% depending on the type of patient and the different definitions. While according to a study carried out in Benin in the operating rooms of the CHU Sylvanus Olympio of Lomé on 172 patients, 4.07 % of patients had bradycardia [99], in our study it was 10.89 %.

Over the 5 years studied, one cardiac arrest was recorded out of 5010 spinal anesthesia performed, i.e. 0.21%. Cardiac arrest occurred 15 minutes after spinal anesthesia with site basting and surgical incision.

A retrospective survey on serious accidents of AR in France in 1993 estimates the number of AR performed at 730,000 over a period of five years. The number of declared cardio-circulatory arrests was 89 (0.01%) [16] and in 1994 a prospective survey over five months enabled 103,730 locoregional anesthesia to be recorded, including 40,640 AR. The number of cardio-circulatory arrests was 26 (0.06%) [17].

In our study the Failure and Conversion to General Anesthesia was 2.77%. The incidence of failure of spinal anesthesia in series including several hundred patients is around 3% [18][19]. A study carried out in Benin in the operating theatres of the Sylvanus Olympio University Hospital in Lomé on 172 patients who had undergone spinal anesthesia, showed a failure rate of 3.34% [20]. In a study evaluating obstetrical spinal anesthesia, which therefore only concerned young women, the failure rate of the puncture was low, but not zero, approximately 1% [21]. The risk of failure is higher in other circumstances. In a study of 100 patients over 80 years of age who underwent surgery for femoral neck fracture, the failure of puncture of spinal anesthesia was 6%. De Fihlo et al [22] evaluated in a group of 1,481 patients that the success rate at the first puncture was only 61.5%.

### **Conclusion:-**

Spinal anesthesia is a remarkable technique of anesthesia. The frequent use of this technique lies in its simplicity and in the effectiveness of the neuronal blockade obtained. While the complications and risks are extremely rare, given their seriousness, prevention requires mastery of the technique, respect for simple safety measures, knowledge of the pharmacology of the products used, detection of prodromal signs announcing serious complications and rapid management of these manifestations. Rigor in the choice of the technique according to the clinic but also to the terrain must be the rule.

### **Références:-**

- [1]. JOHN C., SNOW M.D. Manuel d'Anesthésie, 2Edt, 1991, 2-7-8-10-11-12.
- [2]. Laxenaire MC, Auroy Y, Clergue F, Péquignot F, E Jougla E Lienhart A. Organisation et technique de l'anesthésie. Ann Fr Anesth Réanim 1998 ; 17: 1317-23.
- [3]. J.P. Carpentier, J.P. Banos, R. Brau, G. Malgras, P. Boye, J. Dubicq, G. Angel, C. Roth. Pratique et complications de la rachianesthésie en milieu tropical africain.
- [4]. Les accidents d'anesthésie en 2002. Rapport du Sou Médical 2004.
- [5]. Carpentier JP, Banos JP, Brau R et al. Pratique et complications de la rachianesthésie en milieu tropical africain. Ann Fr Anesth Réanim. 2000; 20: 16-22
- [6]. Clergue F, Auroy Y, Péquignot F, Jougla E, Lienhart A, Laxenaire MC. L'anesthésie en France en 1996. Résultats d'une enquête de la Société française d'anesthésie et de réanimation (SFAR). Chirurgie 1999; 124: 115-21
- [7]. Rout CC, Rocke DA, Levin J, Gouws E, Reddy D. A reevaluation of the role of crystalloid preload in the prevention of hypotension associated with spinal anesthesia for elective cesarean section. Anesthesiology 1993; 79: 262-69
- [8]. Edomwonyi NP, Omoifo CE. Increasing use of regional anaesthesia for prostatectomy. University of Benin Teaching Hospital experience. South Afr J Anaesth Analg. 2008; 14: 13-7

- [9]. Aragão FF de, Aragão PW de, Martins CA de S, Salgado Filho N, Barroqueiro E de SB. Comparison of metaraminol, phenylephrine and ephedrine in prophylaxis and treatment of hypotension in cesarean section under spinal anesthesia. *Rev Bras Anesthesiol* 2014; 64: 299-306
- [10]. Moslemi F, Rasooli S. Comparison of Prophylactic Infusion of Phenylephrine with Ephedrine for Prevention of Hypotension in Elective Cesarean Section under Spinal Anesthesia: A Randomized Clinical Trial. *Iran J Med Sci* 2015; 40: 19-26
- [11]. Jackson R, Reid JA, Thorburn J. Volume preloading is not essential to prevent spinal-induced hypotension at cesarean section. *Br J Anaesth* 1995; 75: 262-65
- [12]. Ewaldsson CA, Hahn RG. Volume kinetics of Ringer's solution during induction of spinal and general anaesthesia. *Br J Anaesth* 2001; 87:406-14
- [13]. Riley ET, Cohen SE, Rubenstein AJ, Flanagan B. Prevention of hypotension after spinal anesthesia for cesarean section: six percent hetastarch versus lactated Ringer's solution. *Anesth Analg* 1995; 81: 838-42
- [14]. Mercier FJ, Riley ET, Frederickson WL et al. Phenylephrine added to prophylactic ephedrine infusion during spinal anesthesia for elective cesarean section. *Anesthesiology* 2001; 95: 668-74
- [15]. Bennis L, Ben Marzouk S, Ajili Z et al. Prévention de l'hypotension induite par la rachianesthésie au cours de la césarienne programmée: coremplissage par HEA 130/0,4 vs sérum salé isotonique. *Ann Fr Anesth Réanim.* 2014; 33: 643-47
- [16]. Auroy Y, Rouvier B, Samii K. Arrêts cardiaques au cours de la rachianesthésie.
- [17]. Auroy Y, Narchi P, Messiah A, Litt L, Rouvier B, Samii K. Serious complications related to regional anesthesia.
- [18]. Pan, P.H., T.D. Bogard, and M.D. Owen, Incidence and characteristics of failures in obstetric neuraxial analgesia and anesthesia: a retrospective analysis of 19,259 deliveries. *Int J Obstet Anesth*, 2004. 13(4): p. 227-33.
- [19]. Tarkkila, P.J., Incidence and causes of failed spinal anesthetics in a university hospital: a prospective study. *Reg Anesth*, 1991. 16(1): p. 48-51
- [20]. Assenouwe S, Tomta K, Mouzou T, Sama HD, Egbohoun P, Lokossou TC. Complications de la rachianesthésie pour chirurgie programmée au CHU Sylvanus Olympio de Lomé
- [21]. Kinsella, S.M., A prospective audit of regional anaesthesia failure in 5080 Caesarean sections. *Anaesthesia*, 2008. 63(8): p. 822-32.
- [22]. de Filho, G.R., et al., Predictors of successful neuraxial block: a prospective study. *Eur J Anaesthesiol*, 2002. 19(6): p. 447-51.