

Grabowska Gawel Anna, Ulenberg Grzegorz, Ulenberg Agata. The occurrence of early complications after subarachnoid analgesia in patients undergoing elective. *Journal of Education, Health and Sport*. 2018;8(4):308-317. eISSN 2391-8306. DOI <http://dx.doi.org/10.5281/zenodo.1226579>
<http://ojs.ukw.edu.pl/index.php/johs/article/view/5436>

The journal has had 7 points in Ministry of Science and Higher Education parametric evaluation. Part b item 1223 (26/01/2017).
1223 Journal of Education, Health and Sport eissn 2391-8306 7

© The Authors 2018;

This article is published with open access at Licensee Open Journal Systems of Kazimierz Wielki University in Bydgoszcz, Poland
Open Access. This article is distributed under the terms of the Creative Commons Attribution Noncommercial License which permits any noncommercial use, distribution, and reproduction in any medium, provided the original author (s) and source are credited. This is an open access article licensed under the terms of the Creative Commons Attribution Non commercial license (Http://creativecommons.org/licenses/by-nc/4.0/) which permits unrestricted, non commercial use, distribution and reproduction in any medium, provided the work is properly cited.
This is an open access article licensed under the terms of the Creative Commons Attribution Non commercial License (http://creativecommons.org/licenses/by-nc/4.0/) which permits unrestricted, non commercial use, distribution and reproduction in any medium, provided the work is properly cited.
The authors declare that there is no conflict of interests regarding the publication of this paper.
Received: 05.03.2018. Revised: 10.03.2018. Accepted: 21.04.2018.

The occurrence of early complications after subarachnoid analgesia in patients undergoing elective

Anna Grabowska- Gawel¹, Grzegorz Ulenberg¹, Agata Ulenberg²

¹ Cathedral treatment of Nursing, Department of Nursing in Intensive Care Medicine, Nicolaus Copernicus University in Torun, Collegium Medicum in Bydgoszcz, Poland

² Fundamentals of Clinical Skills Laboratory and Medical Simulation, Nicolaus Copernicus University in Torun, Collegium Medicum in Bydgoszcz, Poland

Authors contact:

Grzegorz Ulenberg

25/23 Marii Konopnickiej Street, 85-124 Bydgoszcz, District Bydgoszcz, Kujavian-Pomerania, Poland

g.ulenberg@cm.umk.pl

Phone: +48608231607

Abstract

Introduction: Spinal anesthesia, and any method of anesthesia, is not free of complications and side effects. Despite the fact that the use of thin pencil points, piercing a hard tire can be a headache, sometimes with a large therapeutic problem that is rarely present.

Methods: The study was performed in 130 patients aged 28-84 years (mean 56.2 ± 16.2) undergoing orthopedic, urological and surgical operations. Data were obtained from the questionnaire, anesthesia card and nursing documentation and included: sex, age, medication, type and duration of the procedure, presence of degeneration of the spine, obesity, number of

intervertebral fractures and complications related to anesthesia. The t-test, the two-fraction test, the Pearson chi-square independence test.

Results: Early complications occurred in 43.07% of patients, with no demonstrated their relationship to the type and duration of surgery. A significant association between the age of patients and the incidence of hypotension ($p < 0.02$), a TNS ($p < 0.55$), and nausea and vomiting ($p < 0.02$). These complications were significantly more ($p < 0.02$) in patients under 40 years of age Bradycardia was observed only in 7 patients. Urinary retention requiring bladder catheterization occurred in 5.38% of patients as well as nausea and vomiting, which were accompanied by hypotension and bradycardia.

Conclusions: There was no correlation between the occurrence of early complications and the type and duration of surgery. A reduction in the value of SAP and bradycardia was observed in a small percentage of patients. Nausea and vomiting related mainly to young women and accompanied by hypotension and bradycardia.

Introduction

Analgesia is a common spinal anesthesia for the lower half of the body, and the cutting section. Anesthesia is burdened with a relatively low risk of complications, limited contraindications to its high performance and suitability in the elderly, often burdened with concomitant diseases of the circulatory and respiratory systems. They are characterized by simplicity of execution, rapid onset of blockade, lack of toxicity due to the use of small doses of analgesia wired and significantly lower cost of anesthesia compared with general anesthesia[15,19,20].

Among the early complications of subarachnoid analgesia at the forefront of the fall in blood pressure which is the result of sympathetic blockade, bradycardia, and in rare cases, total spinal anesthesia. It is widely accepted that the higher the spinal block, the higher the incidence of bradycardia, although it is also observed at low blockage. Predisposing factors for its occurrence is a young age, ASA I, and treatment with a beta - blocker. Bradycardia unambiguous cause is not known, but the lock off accelerantes (Th1 - Th2) forming the cardiac plexus plays a vital role[11,16,17]. Among the complications later should mention spinal headaches caused by the escape of cerebrospinal fluid - to the spinal epidural space through the hole in the dura mater, nausea and vomiting most often associated with hypotension and bradycardia and involuntary urinary retention due to bladder atony. Also, in

the first postoperative day following the occurrence of a pain syndrome involving back and buttocks of radiation to the lower limbs referred to as transient Neurologic symptoms (TNS), which resolves spontaneously within a few hours to a few days after anesthesia. The cause of back pain is not clear, and their treatment is symptomatic. Later neurological complications in the form of insufficient blood circulation in the course of the spinal cord subarachnoid hematoma.

Methods

The study was conducted in 130 patients of both sexes (67 women and 63 men) aged 28 - 84 years (av. 56.2 + - 16.2 years) who underwent spinal anesthesia for elective orthopedic surgery, urology and general surgery at the University Hospital CM them. Jurasza in Bydgoszcz. All patients were informed about the course of study and gave their consent to take part in them. The study protocol obtained the consent of the Bioethics Committee of the Collegium Medicum Nicolaus Copernicus University in Torun.

The study was conducted in the first postoperative day. Data for the study were obtained from questionnaires, which patients and familiarized with the card and documentation of anesthesia care. Data for the study included gender, age, medications, presence of degenerative changes in the spine, obesity, type and duration of surgery, the number of punctures intervertebral space and the type and incidence of early complications after spinal anesthesia.

Spinal anesthesia was performed with the prior consent of the patient and was preceded by an infusion of 500 ml of liquid electrolyte and registration of blood pressure and heart rate. Lumbar puncture was performed in a sitting position, or on its side at a height L3 - L4 Spinocan puncture using a 27G needle. To obtain anesthesia, 0.5% hyperbaric bupivacaine in a volume of 3 ml. After anesthesia of the patient was placed in the 15 minutes at the back in order to achieve the proper anesthetic within Th10, which was determined by sensory test and cold melt motor block using a scale according to the Bromage.

Immediately after the anesthesia made close observation of the patient, measuring the blood pressure at 2 minutes, following heart rate and oxygen saturation of blood capillary. Hypotension considered for the reduction of SAP <90mmHg, and a reduction in bradycardia HR less than 50 / min, and in case it was administered at a dose of atropine 0.5 mg intravenously. In order to ensure an adequate level of sedation, but no deeper than level 3 Ramsay scale fractionated doses administered midazolam average 0,04mg / kg for all patients

intraoperatively cc transfusion fluid electrolyte. Due to the time and extent of surgery, the patient is not expected of a catheter into the bladder.

For the results of the Student's t-test was used, the two fractions test, test of independence "Chi - square" Pearson assuming the level of $p = 0.05$.

Results

Among the study group, women accounted for 51.4% and 48.6% men. The average age for women was 60.7 years and for men 53.6 years. In the age group below 40 years of age there were 53 patients (40.8%), including 27 women (20.8%) and 26 men (20%). Over 40 years were 77 patients, including 41 women (31.5%) and 36 men (27.7%). The largest group of patients were patients subjected to orthopedic surgery (63%), while 31% of urological surgery- 6%.

Adverse reactions after spinal anesthesia were a total of 55 patients (43.07%), with 20.78% with 22.29% of women and men. The frequency and type of side effects in comparison with gender and age are shown in Tab. 1.

		women	men	Age [years]	
	n: [%]	n: [%]	n: [%]	n: [%]	n: [%]
complications	55 (43.07)	27 (20.76)	28 (22.29)	35 (26.92)	20 (16.15)
hypotension	16 (12.13)	7 (5.38)	9 (6.29)	13 (10.00)	3 (2.30)
bradycardia	7 (5.38)	2 (1.56)	5 (3.84)	5 (3.84)	2 (1.56)
TNS	15 (11.61)	6 (4.63)	9 (6.98)	4 (3.08)	11 (8.46)
nausea. Vomiting	7 (5.38)	5 (3.84)	2 (1.56)	7 (5.38)	0
urinary retention	7 (5.38)	5 (3.84)	2 (1.56)	4 (3.08)	3 (2.30)
Spinal headaches	3 (2.30)	2 (1.56)	1 (0.78)	2 (1.56)	1 (0.78)

Table 1. The frequency of early complication in terms of sex and age

The relation between the age of patients and the incidence of hypotension ($u = 1.84$, $P, 0.04$), TNS unit ($u = 1.71$, $p < 0.55$), and nausea and vomiting ($u = 0.82$, $p < 0.02$). These symptoms occurred significantly more ($p < 0.02$) in patients under age 40. The results are shown in Tab. 2.

Complications	Sex		Test for two fractions		Age [years]		Test for two fractions	
	Women	Men	μ	p	<40 r.ż	> 40 r.ż	μ	p
	[%]	[%]			[%]	[%]		
hypotension	5.38	6.92	0.47	0.64	10.00	2.30	1.84	<0.04
bradycardia	1.56	3.84	1.12	0.26	3.84	1.56	0.60	0.65
TNS	4.63	6.98	1.27	0.20	3.08	8.46	1.71	<0.05
nausea and vomiting	3.84	1.56	1.12	0.26	5.38	0	0.82	<0.02
urinary retention	3.84	1.56	1.12	0.26	3.08	2.30	0.72	0.41
spinal headaches	1.54	0.78	1.23	0.38	1.54	0.78	1.23	0.38

Table 2. Dependence of complications depending on sex and age

There were no association between the occurrence of complications and early coexisting risk factors as osteoarthritis of the spine ($u = 1.15$, $p = 0.42$), obesity ($U = 1.71$, $p = 0.32$) and the number of punctures of the intervertebral space ($u = 1.51$, $p = 0.25$). The results are shown in Tab. 3.

		Risk factors for complications		
complications		degenerative spine disease [%]	obesity [%]	the number of punctures intervertebra l space > 2
do not occur		64.70	47.64	41.17
there		46.59	42.37	58.83
test for two fractions	μ	1.15	1.71	1.51
	p	0.42	0.34	0.25

Tab 3. Risk factors and the incidence of complications

The significant ($p = 0.61$) reduction in blood pressure over 20% of the initial value occurred in 16 patients (12.30%), with 5.38% in women and 6.92% in men. This decline affected patients below 40 years of age and was significantly higher than in patients above 40 years of age ($p < 0.04$). Bradycardia below 50 / min was observed only in 7 patients (5.38%), the 5 patients below 40 years of age ($p = 0.65$).

Discussion

Spinal anesthesia, and any method of anesthesia is not free from various side effects and complications. Among the early complications at the forefront of the arterial hypotension and bradycardia, and in rare cases, total spinal anesthesia. Other complications relatively early, because occurring in the first day after anesthesia should TNS involuntary urinary retention, nausea and vomiting occurring mainly during hypotension and bradycardia and spinal headaches[1,14].

In this work undertaken to determine the incidence of early complications after subarachnoid anesthesia in 130 patients ASA I and II, who underwent planned surgery in the field of orthopedics, urology and surgery. In the present work early complications associated with spinal anesthesia it was observed in 43.07% of patients, with no demonstrated their relationship to the type of operation and the time of its duration.

The literature gives a wide range of incidence of arterial hypotension [1,2,3,4,5], so that the high incidence of disease makes it difficult to be considered in most cases as a complication of the central lock, and rather undesirable. Of course, there are groups of patients with low blood pressure is highly undesirable. These include the elderly, in whom it may result in a decrease in cerebral blood flow and coronary. Test results of this study showed a decrease in systolic blood pressure of less than 20% of baseline in 16 patients (17.68%), where it was significantly higher in patients below 40 years of age. Noteworthy is the fact that these patients belonged to ASA I, and the level of anesthesia does not exceed Th10[9,10,13].

In the group of patients presented bradycardia below 50 / min was observed only in 7 patients (5.30%), and, as in the case of hypotension they were ill below 40 years of age, not taking beta adrenergic blocking agents - blockers before anesthesia and having HR > 60 / min. Given the lack of conformity to what the authors considered to be the boundary of HR bradycardia[6,7] and the small size of the group with this complication, it is difficult to compare the results with the results of other authors[8].

Back pain after spinal anesthesia appearing in the postoperative called Transient Neurologic symptoms (TNS) occur relatively frequently. Their cause is not completely understood, although it is to be expected from their greater intensity after traumatic spinal puncture[8,9,10]. In this work have been reported by TNS in 11.61% of patients, their frequency was significantly higher in men over the age of 40, but she had no connection with degenerative spine disease, obesity and the number of punctures intervertebral space.

The literature indicates that urinary retention after subarachnoid analgesia is not so rare side effect as it might appear, and is depending on the source 1.5 - 14%[1,12,13,14]. In the group of patients it occurred in 5.38% of patients and was manifested as discomfort in the lower abdomen and required a single catheterization of the bladder. Bladder dysfunction are caused by blocking parasympathetic fibers segment S2-S4, which the function returns after subarachnoid anesthesia last. Please note that in order to prevent over-filling of the bladder, and thus protect the patient from the adverse consequences of this, he must urinate within 7 hours of blockade, in the absence of pressure to perform one-time bladder catheterization.

Similarly, common (5.38%) reported nausea and vomiting, wherein they occurred significantly more ($p < 0.02$) in women below 40 years of age with arterial hypotension and resolved after equalization blood pressure. The test results because not a large group of patients may not be representative.

Despite the use of fine needles of the core of the profiled blade (pencil point), thereby puncture the dura mater can be spinal headache (postdural punkture headache) and the incidence of this complication is inversely proportional to the age of patients[13,14]. The test material they only occurred in 3 patients and required neurological consultation, and symptomatic treatment.

The occurrence of late neurological complications[15,16] although it was not the topic of this work, but it should be noted that there has been in the study group.

Conclusions

1. Early complications occurred in 43.07% of patients, while not shown to be due to the type and duration of the operation.
2. The incidence of reductions in systolic blood pressure and bradycardia was observed in a small percentage of patients, and it was lower than presented by other authors.
3. Back pain occurred significantly more often in older men, but were not associated with degenerative spine disease, obesity and the number of punctures intervertebral space.

4. The incidence of urinary retention is comparable with the results of other authors.
5. Nausea and vomiting related mainly to young women and accompanied by hypotension and bradycardia. Spinal headaches are not a significant problem in the postoperative period.

Declaration: All authors have disclosed no conflicts of interest.

References:

1. Boldini G, Bogry H, Aprikian A, Carli F: Postoperative urinary retention: anesthetic and postoperative considerations. *Anesthesiology* 2009; 110: 1139 – 1157.
2. Carpenter RL, Caplan RA, Brown DL, Stephenson C, Wu R: Incidence and risk factors for side effects of spinal anesthesia. *Anesthesiology* 1992; 76: 906 – 916.
3. Castrillo A, Taberner C, Garcia – Olmos LM et al.: Postdural puncture headache: impact of needle type, a randomized trial. *Spine J* 2015; 15(7): 1571 – 1576.
4. Charuluxananan S, Thienthong S, Rungreungvanich M, Chanchayanon T, Chinachoti T, et al. (2008) Cardiac arrest after spinal anaesthesia in Thailand: a prospective multicenter registry. *Anesth Analg* 107: 1735-1741.
5. Chmchad d, Harrow JC, Nakhamchlik L et al.: Prophylactic glycopyrolate prevents bradycardia after spinal anesthesia for cesarean section: a randomized, double – blinded, placebo – controlled prospective trial with heart rate variability correlation. *J Clin Anesth* 2011; 23: 361 – 366.
6. Critchley LA: Hypotension, subarachnoid block and the elderly patients. *Anaesthesia* 1996; 51: 1130 – 1143.
7. Eberhart LH, Morin AM, Kranke P et al.: Transient neurologic symptoms after spinal anesthesia. A quantitative systematic overview (metaanalysis) of randomized controlled studies. *Anaesthetist* 2002 Jul; 51(7): 539 – 546.
8. Ferre F, Marty P, Brunet LE, Merlet V, Bataille B, Rerrier A, et al.: Prophylactic phenylephrine infusion for the prevention of hypotension after spinal anesthesia in the elderly: a randomized controlled clinical trial. *J Clin Anesth* 2016; 35: 99 – 106.
9. Freedman JM, Li DK, Drasner K, Jaskela MC, Lavsten B: Transient neurologic symptoms after spinal anesthesia. *Anesthesiology* 1998; 89: 33 – 641.
10. Hampel KF, Schneider MC, Ummenhofer H et al.: Transient neurologic symptoms after spinal analgesia. *Anesth Analg* 1995; 81: 1148 – 1153.
11. Hartman B, Junger A, Klasen J et al.: The incidence and risk factors for hypotension after spinal anesthesia induction : an analysis with automated data collection. *Anesth Analg* 2002; 94: 1521 – 1529.
12. Javed et al, Spinal anesthesia induced complications in caesarean section- a review, *J. Pharm. Sci. & Res.* Vol.3(10), 2011,1530-1538.
13. Kamphuis ET, Kuipers PW, van Venrooij GE, Kalkman CJ (2008) The effects of spinal anaesthesia with lidocaine and sufentanil on lower urinary tract functions. *Anesth Analg* 107: 2073-2078.

14. Kreutziger J, Frankenberger B, Luger TJ, Richard S, Zbinden S: Urinary retention after spinal anaesthesia with hyperbaric prilocaine 25 in an ambulatory setting. *Br J Anaesth* 2010; 104; 582 – 586.
15. Lavstad RZ, Matmqvist I, Bengtsson P et al.: Vagal and sympathetic activity during spinal anaesthesia: a report of five cases. *Acta Anaesth Scand* 2000; 44: 48 – 52.
16. Olofsson C, Nygardes EB, Bjersten AB, Hessling A: Low dose bupivacaine with sufentanil prevents hypotension after spinal anesthesia for hip repair in elderly patients. *Acta Anaesthesiol Scand* 2004; 48; 1240 – 1244.
17. Picard J, Meek T (2010) Complications of regional anaesthesia. *Anaesthesia* 65: 105-115.
18. Renck H: Neurological complication of central nerve blocks. *Acta Anaesthesiol Scand* 1995; 39: 858 – 868.
19. Zencirci B: Postdural puncture headache and pregabalin. *Journal of Pain Research* 2010; 3: 11 – 14.
20. Videra RIR, Ruiz – Neto PP, Brandao Neto M: Postspinal meningitis and asepsis. *Acta Anaesthesiol Scand* 2002; 46: 639 646.