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1.
INTRATHECAL MORPHINE FOR SPONDYLODESIS POSTERIOR – OUR EXPERIENCE

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Background and purpose: Posterior spondylodesisis a painful operation that requires high doses of opioids for adequate postoperative analgesia. With high doses of opioids, side effects such as nausea, vomiting, urinary retention, and respiratory depression occur, making pain management very challenging, especially in the population of patients undergoing scoliosis operation caused by neuromuscular disease. Although intravenous opioids, especially morphine, are still the most common method of analgesia, various techniques such as intrathecally administered opioids, continuous epidural infusions, intravenous methadone, ultrasound-guided erector spinae block and local infiltrations are lately used more often to achieve satisfactory levels of analgesia. Adequate postoperative analgesia as well as avoidance of opioid side effects leads to faster recovery, reduction of complications of surgery and earlier discharge from the hospital.
Materials (patients) and methods: We will present our experience with intrathecal application of morphine in posterior spondylodesis surgery. After induction of general anesthesia, the patient is placed in a lateral position and under aseptic conditions 5 mcg/kg BW morphine without preservative "Vendal" is administered at the level of L3/L4, up to a total maximum dose of 250 mcg. Other drugs used as a part of the multimodal protocol are: dexamethasone in a maximum dose of 4 mg, ondasetron, paracetamol and pantoprazole. The chosen technique of anesthesia is TIVA withsufentanil and propofol. Significantly lower consumption of opioids and relaxants was observed intraoperatively, with significant hemodynamic stability. Emergence from anesthesia is quick and communication with the patient is easy, which is important due to the early assessment of the neurological status of the lower extremities.
Results: Adequate analgesia with reduced consumption of intravenous opioids was achieved in patients after intrathecal administration of morphine after posterior spondylodesis.
Conclusion: Although there is still no consensus on the optimal analgesic strategy in patients undergoing spinal surgery, priority should be given to effective methods of regional anesthesia and multimodal analgesia while minimizing the use of opioids.
Key words:*posterior spondylodesis, regional anesthesia, morphine, postoperative analgesia*

2.
SPINAL ANESTHESIA WITH HYPERBARIC BUPIVACAINE IN PATIENTS WITH PREVIOUS POSTERIOR LUMBAR SPONDYLODESIS

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Background: Spinal anesthesia (SA) with the titration of anesthetic agents is considered to be one of the choices for a ureteroscopy. However, some anesthesiologists consider previous spinal surgery (in particular patients with

posterior lumbar spondylodesis) anabsolute contraindication to SA because of technical difficulties and incomplete spread of local anesthetics.
Case presentation: We here reportthe successful anesthetic management of ureteroscopy for two male patients with a past history of posterior lumbar spondylodesis.Lumbar anteroposterior (AP) radiograph was obtained before each procedure. Screw-rod system had been implanted as posterior spinal instrumentation at the level of L1-L3.Spinal anesthesia was performed in the sitting position. Hyperbaric bupivacaine combined with sufentanyl were intratracheally administered on the first attempt at the midline of the L4/L5 interspace with a 27G Whitacre spinal needle. Then, patients were turned immediately supine and placed in 15^0 Trendelenburg, and Th10 level of anaesthesia was obtained within 5 minutes.None of the patients experienced complications or reported back pain postoperatively.
Conclusion: Spinal anesthesia can be successfully performed in certain patients, and it is not absolutely contraindicated in the patients who experienced spinal fusions, particularly posterior spinal surgery.It is important to emphasize that, before the procedure, lumbar radiograph and the spine should be assessed and modes of anaesthesia have to be discussed with patient.
Key words: *spinal anesthesia; ureteroscopy; posterior lumbar spondylodesis; hyperbaric bupivacaine*

3.
COMBINED FEMORAL AND LATERAL FEMORAL CUTANEOUS NERVE BLOCK FOR PERIOPERATIVE ANALGESIA IN A PATIENT WITH SEVERE CARDIOVASCULAR DISEASE AND PULMONARY HYPERTENSION UNDERGOING FEMORAL FRACTURE REPAIR - A CASE REPORT

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Optimal preoperative management of cardiac patients ensures better outcomes in the postoperative period. Pain, stress, acidosis, and hypoxemia during surgery can trigger unwanted events in cardiovascular patients with pulmonary hypertension. Such is manifested in right heart failure, pulmonary edema, and critical increase in pulmonary hypertension. Peripheral nerve blocks provide adequate analgesia and better hemodynamic stability in the perioperative period.The fascia iliaca compartment block has been reported to be an effective analgesic technique for hip surgery.Successful analgesia is achieved by blocking the femoral nerve, the lateral femoral cutaneous nerve, and at times the obturator nerve.

An 84-year-old female patient with subtrochanteric femoral fracturewas scheduled for open fracture repositioning and intramedullary nailing.From the medical records, it was found that she had a percutaneous coronary intervention with two stents placed in the LAD six years ago, borderline stenosis of the LAD stents and an 80% stenosis of the central segment of the circumflex artery, a dilatative cardiomyopathy with the left ventricular ejection fraction of 15%–20%,II-III degree mitral valve failure, pulmonary artery pressure of 60 mmHg, and New York Heart Association Class II-III heart failure. We performed an ultrasound-guided single shot lateral femoral cutaneous nerve block and inserted a catheter for continuous femoral nerve analgesia, preopertively. Mixtures of levobupivacaine and lidocaine were used. After achieving an analgesic effect in the area of distribution of both nerves, general anesthesia was induced. The patient was hemodynamically stable during the surgery. Our pain management plan included intravenous paracetamol 1 g every 8 hours, and no additional analgesia was required for the first 12 hours after the procedure. The patient was discharged after eight days.

With adequately and timely performed peripheral nerve blocks, unwanted pathophysiological cardiovascular events can be successfully prevented.
Key words: *femoral nerve block, femoral cutaneous nerve block, analgesia, femur fracture, pulmonary hypertension*

4.
DEXMEDETOMIDINE AS AN ADJUVANT TO LEVOBUPIVACAINE AND LIDOCAINE ENHANCES THE QUALITY OF SUPERFICIAL CERVICAL BLOCK FOR CAROTID ENDARTERECTOMY SURGERY

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Background and Purpose: Numerous additives were tried in combination with local anaesthetics to increase the quality of anaesthesia and prolong postoperative analgesia. Use of α-2 adrenergic receptor agonist as an adjuvant in regional anaesthesia has positive effect on duration of block. However, there are no studies on usage in superficial cervical block (SCB) in carotid endarterectomy (CEA). We therefore designed a prospective, randomised, double-blinded study to investigate the effect of adding dexmedetomidine to levobupivacaine and lidocaine mixture on the quality of SCB in CEA surgery.
Materials (Patients) and methods: SCB was performed on sixty ASA Grade II and III patients undergoing elective CEA surgery. All patients did not receive any premedication and had invasive blood pressure monitoring with parameters noted every 5 minutes. Patients were randomly assigned into two groups. Both groups received 2 mg/kg 0.5% levobupivacaine with 2 mg/kg 2% lidocaine supplemented with saline to a volume of 50 mL. Subject group S additionally received 50 mcg of dexmedetomidine in the mixture. The onset and duration of sensory block and analgesia, haemodynamic parameters and side effects: bradycardia, hypotension, respiratory depression, nausea, vomiting, pruritus and shivering were recorded
Results: Demographic data and surgical characteristics were comparable in both groups. There was no significant difference in block onset times and duration of sensory block between groups. However, time to first analgesia was significantly higher in Group S (N=30) vs control Group C (N=30) (median 1080 [IQR 840] vs. 645 [IQR 333]) minutes respectively, Mann-Whitney p=0 ,0024). Also, the log-rank test indicated a significant difference in the Kaplan-Meier curves for the time to NPRS ≤3 ((p= 0,0328). There was no difference in incidence of side-effects and hemodynamic parameters.
Conclusions: Addition of 50 mcg of dexmedetomidine to the mixture of 0.5% levobupivacaine and 2% lidocaine for SCB does not increase the duration of SCB. But, it does increase the time to first request of rescue analgesia and increases the probability of NPRS ≤3 in the postoperative period, without influence on haemodynamics and frequency of side-effects. a
Key words: *regional anaesthesia; superficial cervical block; dexmedetomidine; carotid endarterectomy surgery*

5.
DEXMEDETOMIDINE AS AN ADJUVANT TO LEVOBUPIVACAINE FOR SPINAL ANESTHESIA IN ELDERLY PATIENTS: PROSPECTIVE, RANDOMIZED, DOUBLE-BLINDED STUDY

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Background and purpose: Spinal anesthesia is a preferred method of anesthesia for lower limb surgery. Antinociceptive synergism between local anesthetics and opioids is well studied. Together they provide superior and effective anesthesia, prolog the duration and effectiveness of postoperative analgesia without prolonging motoric block but with possible side effects (hemodynamic instability, respiratory depression). Dexmedetomidine, selective alpha2-agonist, is well examined as an adjuvant to peripheral nerve blocks, but relatively new as an intrathecal agent. The main goal of this study was to compare opioids with dexmedetomidine as adjuvant to spinal anesthesia, especially their effect on hemodynamic stability in elderly patients. Hypothesis of this study is that dexmedetomidine offers equal quality of spinal anesthesia with lower incidence of side effects.
Materials and Methods: Spinal anesthesiawas performed on thirty ASA Grade II and III geriatric patients undergoing hip surgery. Before the procedure all patients received 500 mL of i.v. saline. Noninvasive blood pressure, heart rate and SpO2 were noted every 5 minutes. Patients were randomly assigned into two groups: control group (n=15) received levobupivacaine by body height normogram with 2.5 mcg (0.5 mL) of sufentanil, while subject group (n=15) received levobupivacaine by body height nomogram with 5 mcg of dexmedetomidine. Groups were compared by hemodynamicparameters, use of vasopressors and side effects: bradycardia, hypotension, respiratory depression.
Results: Baseline patients' characteristics were comparable in both groups. Analysis of hemodynamic data showed that incidence of hypotension, defined as systolic blood pressure lower than 90 mmHg, was not significantly different between groups. Vasopressors were used in 46.7% of cases in control group and 40.0% in subject group, without statistically significant difference. Only one case of bradycardia was reported, in subject group. There was no statistically significant difference between groups in any side-effects reported.
Conclusions: Results of this study show that dexmedetomidine is a safe adjuvant to local anesthetics in elderly patients receiving spinal anesthesia. There is no significant difference between opioids and dexmedetomidine in both hemodynamic stability and the incidence of side-effects.
Key words: *dexmedetomidine, spinal anesthesia, geriatric patients, hip fracture*

6.
UNILATERAL SPINAL ANESTHESIA FOR ORCHIDECTOMY IN A PATIENT LISTED FOR HEART TRANSPLANTATION

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INTRODUCTION: Unilateral spinal anesthesia (UNI SPA) is a type of neuroaxial block that affects motor, sensory and sympathetic function of only one part of the body by providing adequate anesthesia to the area without significant side effects, especially by sympathetic blockade, making it suitable for patients with high cardiovascular risk.
CASE REPORT
A 60-year-old male patient who developed ischemic cardiomyopathy with severe systolic (EF 20%) and diastolic dysfunction and consequent venoocclusive pulmonary hypertension after multiple myocardial infarctions was referred for cardiac transplantation during which tumor was detected on right testicle. Since testicle tumor is contraindication for heart transplantation, an indication with emergency orchidectomy was set. The patient is of functional NYHA III status despite maximal drug and resynchronizing therapy, ASA IV status and metabolic equivalent in physical activity (METś) less than 4. No absolute contraindications for unilateral spinal anesthesia were found in the preoperative preparation. After sterile preparation, the block was performed in the right lateral

position at the L4 / L5 level with a 27 G Whitacre needle without technical difficulties. A hyperbaric solution of 4 mg 0.5% levobupivacaine and 5 mcg sufentanil in a total volume of 2.1 ml was injected over 180 sec (3 minutes), after which the patient was left in the lateral position for another 20 minutes.Upon turning the patient into the supination position, the sensory block on the right side reached the Th10 level with Bromage score 2, without the sensory and motor block on the left side. After assessing the adequacy of the sensory block, surgery is performed during which the patient is respiratory and hemodynamically stable with deviations in pressure and pulse values of less than 5%, without feelings of dyspnea. At the end of the procedure, the patient is transferred to the main cardiology department with normal vital parameters.

D**iscussion:**A patient with chronic heart failure as part of ischemic cardiomyopathy scheduled for non-cardiac surgery poses a major challenge for anesthesia due to the high risk of developing hemodynamic instability, increased myocardial oxygen demand and the development of malignant arrhythmias during general and classic spinal anesthesia. Depending on the procedure, using some of the regional anesthesia techniques, in this case UNI SPA, this risk can be minimized.

C**onclusion**:Properly performed UNI SPA (patient position, needle selection, application rate) using a small dose of local anesthetic and subsequent fixation of the anesthetic long enough in a certain position provides adequate sensory block with little effect on hemodynamics, making it the optimal anesthetic technique in patients with high cardiovascular risk on the type of surgical procedure.

Key words: *unilateral spinal anesthesia, ischemic cardiomyopathy, orchidectomy*

7.
SIMPLE MASTECTOMY WITH SENTINEL LYMPH NODE BIOPSY IN REGIONAL ANESTHESIA WITH SEDATION IN A PATIENT WITH TERMINAL INTERSTITIAL LUNG DISEASE

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Background and purpose:Breast cancer is the most common malignancy in women worldwide and one of the five most common causes of cancer death. For most breast carcinoma patients, surgery is one of the primary therapeutic choices. Most frequently used anesthetic technique for mastectomies is general anesthesia with or without regional block used as assisted or postoperative analgesia.

We present a case of successful mastectomy in a patient with terminal interstitial lung disease (DIP/RB-ILD), that was prior to diagnosis of a breast cancer a lung transplant candidate, by using ultrasound guided regional anesthesia with sedation.

Patient and methods: A 35 year old female with an American Society of Anesthesiology physical status IV with a ductal carcinoma in situ grade 3 in the right breast and a history of severe pulmonary hypertension (WHO III), chronic respiratory insufficiency, chronic gastritis, hiatal hernia (and a past juvenile dermatomyositis) underwent simple mastectomy with axillary lymph nodes excision. Since general anesthesia posed a high risk of mortality, we used ultrasound-guided regional anesthesia for the procedure. The nerve blocks applied were pectoralis plane block (PECS 1 and PECS 2), serratus plane nerve block, and right thoracic paravertebral block (TPVB) up to two levels. A light intravenous sedation with remifentanil and propofol was applied during procedure.

Results: The operation was successfully completed with no complaints about intraoperative pain or discomfort by the patient.The patient was discharged to the post anesthesia care unit (PACU) with stable vital signs and a visual analogue scale (VAS) score for pain 1, and there was no need for intensive care monitoring. There was no reported complaints of PONV and ourplastic surgeons did not report any postoperative complications during patient's stay at the ward.

Conclusion: In conclusion, it seems that both pectoralblocks with serratus muscle block and thoracic paravertebral block combined with an intraoperative sedationis a good anesthetic technique for breast surgery in a patient with severe comorbidities.
Key words: *intraoperative analgesia, peripheral blocks, mastectomy*.

8.
COMPARISON OF DURAL PUNCTURE EPIDURAL AND STANDARD EPIDURAL TECHNIQUE IN LABOR EPIDURAL ANALGESIA- RANDOMIZED SINGLE-BLINDED STUDY

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Background and purpose: Dural puncture epidural (DPE) is modification of standard epidural technique where dural hole is performed by spinal needle, but intrathecal drug administration is with held. Recent studies showed contradictory results regarding the role of DPE in the field of obstetric anesthesia. We hypothesized that DPE would decrease the number of additional epidural boluses, while maintaining parturients' motor function. These condary aim was to assess the incidence of side effects related to neuroaxial procedure such as PDPH (postdural puncture headache), hypotension, nausea and pruritus.
Materials and methods: 55 healthy parturients were randomly recruited in DPE or standard epidural group (EPL). All participants received 500 ml of saline infusion before neuroaxial procedure. Maternal hypotension was defined as a systolic blood pressure less than 90% of baseline value. In DPE group, we used spinal Whitacre needle 27-gauge. All participants received10 ml bolus of 0.125% bupivacaine via epidural catheter, followed by infusion of 0.06% bupivacaine at rate of 10 ml per hour. The bolus and infusion contained fentanyl (1.5 mcg/ml) as ananalgesic adjuvant.Pain during uterine contraction and motor function were assessed in an hour intervals until delivery by numeric pain rating scale (NPRS) and Bromagescale, respectively. The number of additional manual epidural boluses (in case of NPRS>3) was recorded in both groups, along with record of blood pressure, nausea and pruritus. The presence of side effects was evaluated every hour from first bolus until delivery.All participants were visited on first postpartum day by anesthesiologist who assessed the presence of headache.
Results: There was no significant difference in number of additional boluses among groups (p=0.748), while Bromage scale was comparable between groups (p=0.341). Concerning secondary outcome, none of participants reported PDPH. Also, there was no statistically significant difference in any of recorded side effects.
Conclusion: Although DPE does not decrease the number of additional boluses, it appears as technique with favourable safety profile compared with standard epidural technique in obstetric anesthesia. Following this, it could be implemented in clinical practice.
Keywords: *epidural analgesia, dural puncture epidural, obstetric anesthesiology*

9.
SPINAL ANAESTHESIA FOR EMERGENCY CAESAREAN SECTION IN PARTURIENT WITH SEVERE MITRAL REGURGITATION AND ACUTE HEART FAILURE

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Background and Purpose: Maternal heart disease are the main course of maternal morbidity and mortality. The biggest group are compensated asymptomatic valvular disease that might decompensate during 2nd trimester of pregnancy or during labour. This is due to physiologic changes of pregnancy that carry significant burden on the cardiovascular system. In case of acute heart failure, cardio-obstetric-anaesthesiologic team should be referred to for decision making.
Materials (Patients) and methods: Parturient, 26y, BMI 37,7kg/m^2, was hospitalised in 32nd gestation week due to oligohydramnios and gestational diabetes. Severe mitral regurgitation was found on cardiac ultrasound, with preserved ejection fraction (65%). She had no heart related symptoms on exam. She was readmitted to hospital in 38th gestation week due to foetal tachycardia and intrauterine growth restriction. On admission she was dyspnoeic, with accompanying acute respiratory infection. She had clinical signs of acute heart failure with vitals: IBP 140/80mmHg, c/p 115/min, spO2 92% with oxygen on nasal canula 2,5l/min flow. Due to impending pulmonary oedema, a decision to perform emergency caesarean section under spinal anaesthesia was made.
No intravenous co-loading was done and apart from standard anaesthesia monitoring, intraarterial cannula was inserted for invasive arterial blood pressure monitoring. Single shot spinal using mixture of 0,5% hyperbaric bupivacaine (1,7ml) and fentanyl (0,4ml) was performed on L3-4 interspace. Upper body tilt was done upon application and oxygen therapy continued (6l/min mask with reservoir). During the caesarean section, the patient remained haemodynamic stable, without dyspnoea. Diuretic therapy was introduced immediately after foetal delivery. Postoperatively the patient was admitted to intensive care unit. Radiologic findings were consistent with heart failure and diuretic therapy was intensified. She was discharged from hospital on 14th day.
Results: Spinal anaesthesia for emergency caesarean section in our patient with severe mitral regurgitation and acute heart failure was shown to be a wise choice, without further aggravation in form of pulmonary oedema or haemodynamic instability.
Conclusions: Low dose spinal anaesthesia with mixture of local anaesthetic and opioidcombined with careful haemodynamic monitoringshould be considered safe choice in parturient with acute heart failure due to severe mitral regurgitation presenting for emergency caesarean section.
Key words: *pregnancy, severe mitral regurgitation, acute heart failure, emergency caesarean section*

10.
THE ADVANTAGE OF APPLYING PERIPHERAL REGIONAL ANESTHESIA IN PATIENT WITH SEVERE CARDIOVASCULAR DISEASE- CASE REPORT

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Introduction. The use of peripheral regional anesthesia has achieved great success in the last 30 years, and the development of new techniques, especially the use of ultrasoundimaging, has led to even greater progress in this area. Peripheral nerve blocks are a routine part of daily anesthesiologist practice today.They are used to block the peripheral nerves or nerve plexuses, allowing anesthesia of the specific area of the body on which the surgery is performed.
Objective. The goal of this case presentation is to emphasize the advantage of using peripheral regional anesthesia in patients with severe comorbidities.
Subjects and methods. In this report we present a case of a patient with chronic vascular and cardiac morbidity who was admitted to hospital due to a chronic inflamed ulcer of the left ankle. Due to anamnestic data which included presyncope, ultrasound investigations were performed and EFLV of 32% was diagnosed on echocardiography, while a CDFI of cervical vessels showed right ACI stenosis of 40%. In addition, laboratory blood

investigation diagnosed liver disease and hyperlipidemia, while also confirming previously known DM II. An anesthesiologist evaluated the patient as ASA 3E. Given the urgency of the disease, we decided to do a femoral and popliteal peripheral nerve block. Under ultrasound control a total of 30ml of 0.5% levobupivacaine with 4mg of dexamethasone was injected. We used an atraumatic Stimuplex needle (20 Ga). As premedication the patient received 50mcg of fentanyl.

Results. After the blockade of the peripheral nerves, the patient was hemodynamically stable, respiratory sufficient. Twenty minutes after performing the regional block, the operation began with an excellent sensory blockade of the operating area. Intraoperatively, vital parameters were stable all the time, as well as postoperatively, with good analgesia up to 12 hours from the initial nerve block.

Conclusion. The use of peripheral regional anesthesia provides excellent anesthesia and analgesia for many surgical procedures. It reduces morbidity and mortality, provides better postoperative analgesia as well as faster recovery after surgery and lower treatment costs. Appropriate selection of patients for this type of anesthesia and the experience of anesthesiologists in cooperation with the surgeon are the main factors of success of peripheral regional anesthesia.

Keywords: *peripheral nerve block, ultrasound, vascular disease, cardiopathy*

11.
VASOVAGAL REACTION TO SPINAL ANESTHESIA DURING ORCHIDECTOMY - WHAT DO WE DO WRONG?

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Background and purpose: The vasovagal reaction is a reflex activity characterized by cardiovascular depression, bradycardia, and a loss of consciousness resulting from an imbalance of sympathetic and parasympathetic heart rate control. According to the literature, the incidence of vasovagal reactions is up to 5%, and it is more common in younger male patients. Most orchidectomies are performed in younger men aged 18 to 35 years due to suspected testicular tumors, very often under spinal anesthesia, which is why a higher incidence of vasovagal syncope is to be expected.

Materials (patients) and methods: The cross-section of orchidectomies performed at our Clinic in the period from July 2021 to May 2022 is as follows: out of a total of 27 orchidectomies performed, 19 of them were performed under spinal anesthesia. Among them, in two cases, vasovagal syncope was observed immediately after the application of spinal anesthesia.

Results: Both cases of vasovagal syncope occurred in previously healthy young men, aged 29 and 35 years, ASA 1 and 2 status, with a high level of preoperative anxiety. Spinal anesthesia was performed in a sitting position with a 25 G pencil point needle at the L2-L3 or L3-L4 level. A mixture of 1.4 mL 0.5% levobupivacaine, 5 mcg sufentanil and 0.6 mL 40% glucose was administered. Vasovagal syncope was manifested by bradycardia and loss of consciousness within 30 to 60 seconds of intrathecal administration. Bradycardia <40 / min was corrected with 1 mg atropine, and recovery of consciousness occurred spontaneously after return to supination position.

Conclusion: Given the age structure of patients and the specificity of the diagnosis associated with high levels of anxiety, an increased incidence of vasovagal reactions is to be expected if patients are not adequately prepared with preoperative anxiolytic treatment (benzodiazepine premedication). Lateral decubital position for spinal anesthesia should be considered in these cases.

Key words: *spinal anesthesia, orchiectomy, vasovagal reflex, bradycardia, syncope*

12.
PATIENT CONTROLLED FEMORAL NERVE BLOCK FOR ANALGESIA AFTER TOTAL KNEE ARTHROPLASTY - OUR EXPERIENCES

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Background and purpose Total knee arthroplasty is associated with significant postopertive pain. Adequate analgesia following total knee arthroplasty facilitates rehabilitation, improves patient satisfaction and may reduce the length of hospital stay. Continuos femoral nerve block using local anesthetics is an effective method for treating postoperative pain. This type of analgesia reduce total opioid consumption, pain scores on VAS scale, shorten recovery times and decrese postoperative adverse events.
Materials (Patients) and methods In patients who underwent total knee arthroplasty a perifer femoral catheter was inserted. Local anesthetic was administred continuously and in bolus dose on demand.
The VAS pain scale and the consumption of non-opioid analgesics was monitored postoperatively in the next 24 hours. The study group was compared with a group of patients who received standard intravenous analgesia (used on our department) after the same surgical procedure.
ResultsThe group of patients with patient controlled femoral nerve block in the first 24 hours had significantly lower values on the pain scale and the consumption of non-opioid analgesics was much lower.
ConclusionsThe use of patient controlled femoral nerve block is very effective analgesic method in the postoperative period after surgery for total knee arthroplasty.
Keywords:*patient controlled femoral nerve block, total knee arthroplasty, perioperative analgesia*

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COMPARISON OF SUPERFICIAL CERVICAL PLEXUS BLOCK AND COMBINATION OF SUPERFICIAL CERVICAL PLEXUS AND CAROTID SHEATH BLOCK IN CAROTID ENDARTERECTOMY SURGERY

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Background and purpose: Carotid endarterectomy (CEA)isa common procedure performed under regional anaesthesia providing monitoring of cerebral function in real time. Numerous techniques of regional cervical blocks exist but superficial cervical plexus block (SCB) is one most commonly used**.**The aim of this study was to compare regional anaesthesia using only superficial cervical plexus block with an ultrasound-guided carotid sheath block combined with superficial cervical plexus block for CEA.
Materials and methods: Patients undergoing elective CEA surgery were randomly assigned into two groups: one receivedultrasound-guided carotid sheath block andSCB (n=12)while another group received SCB only (n=18). Patients did not receive any premedication. All patients were ASA grade II and III and had invasive blood pressure monitoring with parameters noted every 5 minutes. Both groups received mixture of 2 mg/kg 0.5% levobupivacaine and 2mg/kg 2% lidocaine supplemented with saline to a volume of 50 mL.The onset and duration of sensory block and time to first analgesiawere recorded. Analgesia was measured using numeric pain rating scale (NPRS) every 2 hours, up to 12 hours after regional block was performed. A log-rank test was

performed to compare a probability of NPRS≤ 3 during follow-up time, with results described as Kaplan-Meier curves.

Results: Demographic data and surgical characteristics were comparable in both groups. Block onset time and duration of sensory block werenot statistically different inboth groups. Time to first analgesia was slightly higher in the group of patients receiving ultrasound-guided carotid sheath block with SCB (difference of medians 124 minutes), but the difference was not statistically significant. Also, postoperative pain in the first 12 hours described as a probability ofNPRS≤ 3 was more prominent in patients having received only superficial cervical plexus block (66.6% as opposed to 58,3%), but log-rank test showed no significant difference.

Conclusions: Our early researchdata do not show benefits of addition of ultrasound-guided carotid sheath block in prolonged postoperative analgesia i.e., time to first analgesia. However, a larger sample size is needed for better statistical power to confirm whether the use of ultrasound-guided technique could prove more beneficial in prolonging postoperative analgesia andsensory block duration time.

Key words: *carotid sheath block, superficial cervical plexus block, regional anaesthesia, ultrasound, carotid endarterectomy*

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USE OF ROPIVACAINE FOR SUPERFICIAL CERVICAL BLOCK: A PROSPECTIVE, RANDOMIZED, DOUBLE-BLINDED STUDY

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Background and purpose: Carotid endarterectomy is often indicated in patients suffering from multiple chronic conditions. Apart from general anesthesia, this surgical procedure can be performed with the use of superficial cervical block. This anesthesiological approach makes it possible to promptly recognize neurological deficits that are known to happen during the procedure, enabling swift surgical reaction. Ropivacaine is a local anesthetic that has shown good safety record in regards to neurotoxicity and cardiotoxicity. The study hypothesis is that ropivacaine mixed with lidocaine provides a block that has faster onset and longer duration of action compared to mixture of levobupivacaine and lidocaine, simultaneously offering the same quality of infiltration anesthesia.

Materials and methods: The anesthetic mixture for superficial cervical block was composed of lidocaine in fixed dose of 200 mg, and of a second local anesthetic. Patients (N=45) were randomly divided into two groups. Ropivacaine 2 mg/kg was used as the second local anesthetic in the experimental group (N=30), whereas the control group received levobupivacine 2 mg/kg instead (N=15). Normal saline was added so the mixture measured 50 mL total. After the neck was infiltrated using the appointed mixture, several values were measured: onset time and total duration of sensory block, and pain assessment was made using the NPRS scale each 2 hours during 12 hours in total. The analysis was performed using propensity score matching with optimal pairing without switching and using the closest neighbor method 1:1 with distance calculated using logical regression.

Results: The results showed that there were no statistically significant differences regarding block onset time (p=0.148), total block duration (p=0.775), need for additional analgesia (p=0.831), nor NPRS scores (p=0.456).

Conclusions: Being perceived as one of the local anesthetics with the least side effects, ropivacaine is undoubtedly worth to be considered a drug of choice for performing regional anesthetic procedures. The results of this study are encouraging. Ropivacaine showed similar anesthetic properties as levobupivacaine, simultaneously possessing possible advantage of having favorable neurotoxic and cardiotoxic profile.

Key words: *ropivacaine, levobupivacaine, lidocaine, superficial cervical block*

15

INTRATHECAL APPLICATION OF MORPHINE FOR ANALGESIA AFTER TOTAL HIP ARTHROPLASTY - OUR EXPERIENCES

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Backgroundandpurpose: Spinal anesthesia involving intrathecal morphine isused as a combined opioid-sparing technique. It is useful in extremely painful surgical procedure ssuch as joint replacement operations. Intrathecal doses of morphine, which usually range from 35 μg to 500 μg, while the most commonly tested dose was 100 μg. The advantage of intrathecal morphine is its expansion into the subarachnoid space with direct access to opiate receptors and ion channels. The clinical duration of action of intrathecally administered morphine can be up to 20 hours depending on the biphasic pattern.
Disadvantages are side effects associated with opioid use such as respiratory depression, pruritus, nausea, vomiting. The application of the optimal dose of morphine intrathecally will have an adequate analgesic effect and a minimum number of side effects.
Materials (Patients) and methods: Spinal anesthesia with 0.5% Levobupivacaine with the addition of morphine for intrathecal administration at a dose of 200 μg was administered to patients who underwent surgery for total hip arthroplasty. The VAS pain scale was monitored postoperatively in the next 24 hours and the consumption of non-opioid analgesics. Side effects have also been reported (respiratory depression, nausea and vomiting, pruritus). The study group was compared with a group of patients who received standard intravenous analgesia after the same operation.
Results: The group of patients in whom morphine was administered intrathecally in the first 24 hours had significantly lower values on the pain scale and the consumption of non-opioid analgesics was much lower.
Conclusions: The use of intrathecal morphine at a dose of 200 ug is anextremely good analgesic method in the postoperative period after surgery for total hip arthroplasty.
Keywords:*intrathecal morphine, total hip arthroplasty, perioperative analgesia*

16.

INTRAOPERATIVE AND POSTOPERATIVE ANALGESIA WITH THE INTRATHECAL APPLICATION OF MORPHINE FOR RENAL RESECTION – A CASE REPORT

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Background and purpose: Lumbotomy for kidney resection causes severe postoperative pain that can be treated with neuraxial analgesia techniques. Spinal analgesia compared to epidural analgesia significantly reduces the length of hospital stay after an open nephrectomy. (1) According to the literature, a single intrathecal application of morphine reduces postoperative opioid consumption after abdominal surgery (2). We present a case report of a patient who underwent combined general and spinal anesthesia with the addition of intrathecal morphine for open resection of the renal tumor in order to reduce intra- and postoperative opioid consumption.

Materials (Patient) and methods: A 40-year-old patient, ASA I status, was hospitalized for surgical treatment of ultrasound-detected expansive heterogeneous formation of the right kidney. After preoperative preparation and premedication, the patient was administered spinal anesthesia (sufentanil 2.5 mcg, levobupivacaine 10 mg, morphine 150 mcg, 40% glucose 0.4 ml), level L3-L4, using a Quincke needle 26 G. After spinal application, the patient was placed in the Trendelenburg position with the table slightly tilted to the right. After 10 minutes, the patient was tilted back to prone. After induction of general anesthesia with propofol, sufentanil, and rocuronium, the surgery was performed.
Results: Tumor resection was performed through the classic left lumbotomy. Anesthesia and the surgical procedure went smoothly without any unexpected complications. During the 2.5 hours of the surgical procedure, there was no need for additional intravenous analgesia. During the first 24 hours postoperatively, in the incision area, satisfactory analgesia was achieved with administration of intravenous 1g of paracetamol 3x and 100 mg ketoprofen/ 100 ml of 0.9% NaCl 2x. In this case, no side effects developed after the spinal administration of morphine.
Conclusion: Intrathecal application of morphine with a local anesthetic provides prolonged analgesia and thus reduces the need for intraoperative and postoperative opioid consumption. However, further research is needed to determine whether perioperative intrathecal morphine administration affects overall postoperative recovery after open renal resection.
Key words: *intrathecal morphine, analgesia, renal resection*

17.
I-GEL: A SOLUTION FOR SEDATED PATIENTS IN REGIONAL ANESTHESIA IN PRONE POSITION

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SUMMARY - Delivering anesthesia is an artform. Careful planning and technique lead to superior results. The simplestandmost effective anesthesia method is considered and tapered to the needs of the patient.Regional anesthesia has increased in popularity for this reason, not only for operative use, but also for postoperative pain relief.Regional anesthesia relies on a patient to comply with its preparations and application. At times, patients are nervous andmay be hypersensitive to any manipulation being performed on them. Light sedation can often resolve some of this nervousness. However, sometimes a deepersedation may be preferred. This can be challenging if the patient is already placed in a prone position, for the surgical procedure.Induction for a prone position usually recommends endotracheal intubation. The process first begins in supine position, then following placement and fixation of the endotracheal tube, the patient is rotated. The prone induction method with an i-gel alleviates the use of muscle relaxants,as needed with endotracheal intubation. This increases patient safety by keeping muscle tone normal, minimizes rotation of the patient, and reduces possible injury among staff involved in rotating.The method is used for a variety of operations world wide with excellent results, with minimal risk and appropriate ventilation of patients. Careful planning and team discussions prior to the operation are absolutely necessary, to form anesthetic and operative plans. Patient fasting is a must, nil by mouth for 8 hours. The prone position induction,with an i-gel, can be an important alternative and versatile method to use in conjunction with regional anesthesia, or on its own.
Key words: *I-gel, sedation, regional anaesthesia*

18.
IVRA: REVIEW OF THE MOST IMPORTANT LOCAL ANESTHETICS AND ADJUVANTS

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SUMMARY - Intravenous regional anesthesia is primarily used in surgical procedures of the distal parts of the extremities that can be reliably performed up to 60 minutes. Numerous advantages of IVRA are ease of use, reliability, economy, the ability to perform in an outpatient setting, high success rate, and rapid recovery. On the other hand, the toxicity of local anesthetics, delayed onset of action, poor muscle relaxation, poor postoperative pain control, and tourniquet pain are limiting factors. Therefore, different local anesthetics and different groups of adjuvants seek to emphasize the positive and minimize the adverse effects. Lidocaine, prilocaine, and ropivacaine are the most commonly used local anesthetics, while non-steroidal anti-inflammatory drugs, alpha-2 agonists, dexamethasone, opioid analgesics, non-depolarizing muscle relaxants, and many others are the most commonly used adjuvants. This article aims to systematize the most important drugs used in IVRA, their effects, and their limitations.
Keywords: *intravenous regional anesthesia, local anesthetics, adjuvants*

19.
EFFICACY OF PERIOPERATIVE INTRAVENOUS LIDOCAINE ON REDUCINGCHRONICPOSTSURGICALPAINAFTERBREASTCANCERSURGERY

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Background and purpose: Chronic postsurgical pain (CPSP) occurs in approximately 10% of surgical patients and is acommon complication after breast cancer surgery. Research on prevention of CPSP suggeststhat the perioperative use of intravenous lidocaine may decrease the incidence of CPSP three and six months after breast surgery.
Materials and methods: We investigated the results from controlled randomised trials in the last five years. These trials included 514 patients and assessed the incidence of CPSP after breast cancer surgery in women receiving intravenous lidocaine or placebo. Patients were randomized into two groups; lidocaine (1.5 mg/kg bolus of intra-

venous lidocaine followed by 2mg/kg/hr infusion) or control group (saline). One recent pilot study tested further subcutaneous administration of lidocaine postoperatively for up to 12h (1,33mg/kg/h). In the trials different tools for pain scoring were used, for instance Numerical Rating Scale (rest/movement), yes/no scoring, Brief Pain Inventory, Neuropathic Pain Questionnaire,SF-MPQ-II.
Results: After three months, more than half of the patients reported CPSP. Lidocaine decreased the development of CPSP(63% vs 43,1%). The incidence of any pain or discomfort related tothe surgical wound was lower in the lidocaine group than with placebo: 20% vs. 25% at 3 months, and 27% vs. 30% at 6 months, while moderate or severe CPSP was not significally reduced: 13% vs. 9% at 3 months and 12% vs. 12% at 6 months. Patients with moderate or severe CPSP reported severer neuropathic disorders than those with mild CPSP. One study showed reduction of pain at rest at 6 months in the lidocaine group vs placebo.
Conclusions:Analyzing clinical trials, we conclude that intravenous perioperative lidocaine affects the development of CPSP after breast cancer surgery. Lidocaine has a positive impact on acute postoperative recovery, therefore surely preventing CPSP. More data by testing preventive administration of lidocaine alone or as a part of multimodal analgesia during and after breast cancer surgery should be collected. To evaluate CPSP by intensity, pain character and life quality modified neuropathic pain scales could be used.
Keywords:*chronic postsurgical pain, lidocaine infusion,breast cancer surgery*

20.
THE ROLE OF REGIONAL ANESTHESIA IN PERIOPERATIVE IMMUNOLOGICAL RESPONSE AND BREAST CANCER

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SUMMARY - **Background and purpose:** There are numerous indications for breast surgery like; evacuation of abscesses, cosmetic procedures, tumour removal, etc. Since 1990, the incidence of breast tumours has increased by 20% and in women it is the most common cause of death from malignancy. Anaesthesia can influence the stress response by central modulation (general anaesthesia), afferent blockade (regional anaesthesia) or by interaction with the endocrine system (etomidate). It is known that general anaesthesia can suppress cellular and humoral immunity by acting on immune-competent cells, gene expression and secretion of inflammatory mediators. Opioids and/or, their mode of administration show a different effect on the immune system: immune suppression, immune stimulation or both. In contrast, local anaesthetics are efficient in treating acute and chronic inflammation because they deactivate inflammatory processes on different levels, including, the monocyte-macrophage system, decrease of oxygen metabolites and free radical formation, histamine liberation, release of interleukin (IL-1α) and leukotrienes. The aim of this narrative review is to provide an analysis of the effectiveness of various techniques of regional anaesthesia alone or in combination

with general anaesthesia, in this setting, with an emphasis in achieving a more favourable immune response in comparison to other modalities.
Materials and methods: We have conducted a search of current medical literature written in English through Google Scholar, PubMed, and Ovid Medline®. Review articles, Peer-reviewed professional articles, retrospective and prospective studies, case series and case reports were systematically searched for during the time period between November 2010 and March 2021.
Results: The literature used for the purpose of creating this review showed that utilisation of various techniques of regional anaesthesia alone or in combination with general anaesthesia, has a positive effect on immune response.
Conclusions : Application of various techniques of regional anaesthesia (infiltration with local anaesthetic, thoracic epidural anaesthesia and analgesia, paravertebral block, pectoral nerve blocks, serratus anterior plane block, intercostal nerve blocks and erector spinae plane block) in breast surgery, is superior to other analgesic methods and also reduces postoperative blood loss. Because of these significant advantages, today, the use of regional anaesthesia is widespread in breast surgery and other oncological surgery.
Key words: *anaesthesia; analgesia; breast surgery; immune system; local anaesthetics*

21.
UNILATERAL HYPOBARIC SPINAL ANESTHESIA IN PATIENTS WITH DEVELOPMENTAL DYSPLASIA OF THE HIP

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SUMMARY - Developmental dysplasia of the hip (DDH) is characterized by abnormal development of the hip joint, resulting in joint pain and destruction of articular cartilage.If there is no improvement after conservative treatment,it seems that surgery is the reasonable one.Surgery can be done in general or regional anesthesia depending on duration of procedure and comorbidities of the patient. Spinal anesthesia can be unilateral to preserve cardiovascular stability.Hypobaric unilateral anesthesia is even more advantageous because patient is laying on healthy side of the body during performance of anesthesia and surgery.
Case presentation
A 30-year old woman with osteoarthritis secondary to DDH was admitted to Clinical hospital for traumatology Zagreb for total hip arthroplasty. After preoperative assessment, the surgery was scheduled. Routine monitoringwas started and two intravenous lines were placed. In left decubital position, subarachnoidal space was identified at level L3/L4 and 1.7mL of0.5% hypobaric levobupivacaine was administered. Level of sensory and motor blockade was evaluated using the modified Bromage scale.Procedure began 35 minutes after performing spinal anesthesia and lasted 4 hours, without cardiovascular instability.During operation, because of discomfort and pain in upper part of the body, we added analgesics and started propofol continuously. During last third of procedure, spinal anesthesia started to fade so we added 5mcg of sufentanil more. After procedure, patient recieved infrainguinal ultrasound-guided FICB using 0.25%levobupivacaine 40mL and tramadol 100mg and paracetamol 1g intravenously.
Discussion: According to previous research, unilateral anesthesia was reserved for shorter procedures, but through this case we showed that longer surgeries could be done by adjusting a dose and using an adjuvans without significant impact on hemodynamic variability.

Conclusions: Advantages of unilateral spinal anesthesia are cardiovascular stability and lower incidence of systemic side effects. In comparison to classic spinal anesthesia, when unilateral hypobaric one is used, patient lies on the healthy side during the anesthesia performance and surgery. By slow rate of local anesthetic application and keeping the patient in lateral decubitus position,the *success rate* of subarachnoidal *block is greater.*
Key words: *unilateral, hypobaric spinal, FICB*.

22.
TOPICAL AND REGIONAL ANESTHESIA FOR AWAKE TRACHEAL INTUBATION, A NARRATIVE REVIEWTOPICALIZATION AND ATI

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SUMMARY - Instrumentation of the upper airway is linked with impressive autonomic system stimulation and can be really unpleasant for the patient and linked to complications. Upper airway is innervated with three cranial nerves: n. Trigeminus; n. Glossopharyngeus and n. Vagus. making it an extremely stimulating region. Therefore it is important to properly anesthetize this region before performing airway management. There are three main options for doing this: topical anesthesia with or without sedation; general anesthesia; or regional anesthesia. Depending on the patient's comorbidities, airway assessment, region of operation, surgery type, and performers skills, combinations of aforementioned techniques are possible. This review will light topical anesthesia techniques for awake intubation and regional anesthesia blocks for airway management.
Introduction: State the purpose of the article and summarize the rationale for the study or observation. Give only strictly relevant references and do not include data or conclusions from the work being reported.
Methods: We searched PubMed, Web of Science, Medline, Scopus, and ResearchGate with no limitations of the year of publication nor language restriction using a predefined search strategy "hepatitis E virus", human and Croatia. Once a comprehensive list of abstracts has been retrieved and reviewed (by both authors), studies appearing to meet inclusion criteria were reviewed in full. Studies non-relevant for the topic or the ones with data inconsistency were also excluded as assessed by the authors. Books, dissertations, review articles, meta-analyses, non-English articles, and unpublished reports were excluded.
Discussion: Emphasize the new and important aspects of the study and the conclusions that follow from them. Do not repeat in detail data or other material given in the Introduction or the Results section. Include in the Discussion section the implications of the findings and their limitations, including implications for future research, but avoid unqualified statements and conclusions not completely supported by the data. Relate the observations from your study to other relevant studies. State new hypotheses when warranted, but clearly label them as such.
Abbreviations: Use only standard abbreviations. The full term for which an abbreviation stands should precede its first use in the text unless it is a standard unit of measurement.
Acknowledgments: List all contributors who do not meet the criteria for authorship, such as a person who provided purely technical help, writing assistance, or a department chair who provided only general support. Financial and material support should also be acknowledged.
References: References should be numbered consecutively in the ordering which they are first mentioned in the text. Identify references in the text, tables, and legends by Arabic numerals in superscript. Also, the reference list must be arranged so that each reference contains the matching DOI number.
References style should follow the NLM standards summarized in the International Committee of Medical Journal Editors (ICMJE) Recommendations for the Conduct, Reporting, Editing and Publication of Scholarly

Work in Medical Journals: Sample References, available at the webpage http://www.nlm.nih.gov/bsd/uniform_requirements.html

Key words: *topical anesthesia, regional anesthesia, airway management*

23.

REVIEW OF THE FIRST CLINICAL EXPERIENCES WITH CHLOROPROCAINE HCL1% IN SPINAL ANAESTHESIA FOR CAESAREAN SECTION

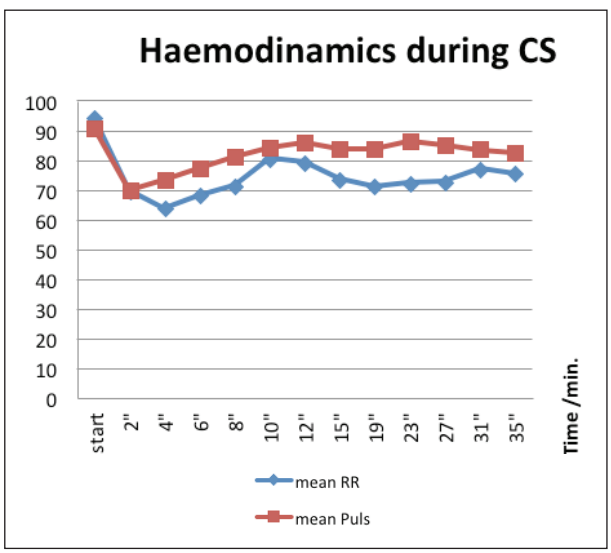
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Background and purpose: This prospective, randomized, observer study has been conducted in parturients undergoing elective CS to evaluate the speed of onset of the spinal block, its sensory qualities, and the time to complete block resolution of chloroprocaine 1%. The aim was to evaluate how effective it is in abdominal surgery according to Misgav Ladach, whether it is reliable for emergency spinal anesthesia, and how much it allows for early maternal recovery.

Materials and methods: After informed consent, we enrolled 14 first-born mothers, aged 26-37 years, ASA score I-II, BMI 26-34 kg/m2, in whom a relatively urgent caesarean section was indicated due to fetal bradycardia, meconium, primary inertia of labor,and suspected placental abruption. The default approach to spinal block was at L4 / L5 in sitting position with a midline approach, while in determining the dose of Chloroprocaine the criteria were a woman's height; > 1.75m / 50mg; > 1.60m / 40mg; <1.59m / 35mg; without modification of original baricity or application of any adjuvant. Hypotension, ie reduction of SBP by 30% compared to baseline values was treated with i.v. ephedrine boluses.

Results: Within 4 minutes of the given block, an operative incision was started in all patients, because the level of the achieved sensory block was at acceptable Th7, and the Bromage score was 2 (> 66%). Adequate spinal block was achieved in 12 patients because no additional analgesia (sufentanyl 10 micgr) or sedation (midazolam 2,5 mg) was required. The average time for spinal blok resolution was 87 min.(75 - 100 min.) with stable hemodynamics.

Mean dose of chloroprocaine	41 mg
Average Op.CS time	37 min (30 – 45 min.)
Pinprick at end of CS	Th 9 - Th10
Bromage at end of CS	3 (100%in all pat.)
Childbirth time (from onset of the block)	10 min (9 – 12 min)
Block resolution average time	87 min (75-100 min.)
Ephedrin i.v. (No. patients treated)	12
Ephedrin i.v. (average dose)	7,14 mg
Tot.infusion vol. (average crystalloids)	857 ml
Syntocinon i.v. (standard dose)	20 mg



Conclusion: Chloroprocaine in a dose of 40 mg is a safe and reliable option in spinal anesthesia for caesarean section, even in emergencies.

Key words: *Spinal anaesthesia, caesarean section, chloroprocaine*